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ACROCEPHALY WITH ASSOCIATED SYNDACTYLISM.

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RECENTLY in drawing attention to the wealth of general clinical material associated with mental deficiency I made brief reference to two oxycephalics (steeple heads) at the Mental Hospital, Newcastle. Better examples could hardly be found, since these possess features of great interest to the embryologist, to the anatomist and to the surgeon, in fact to most students of medicine. The cases are sufficiently rare to merit fuller publication. Apert in 1906 published an account of eight cases in which there were deformities of the head, hands and feet, a condition which he regarded as a definite clinical entity, "acrocephalosyndactylism." Park and Powers[2] in 1920 were able to collect twenty-nine cases chiefly from the literature. They come to the conclusion that

> It seems unjustifiable to regard the combination of malformations of head and extremities as a clinical entity. The significance of their occurrence together appears to be merely an inconstant association. The malformation seems to have the special tendency when appearing in the head to appear also in the extremities. We believe, therefore, that it is necessary to think of acrocephalic and scaphocephalic malformations existing alone and acrocephalic and scaphocephalic malformations existing in combination with symmetrically distributed malformations of the extremities, not as distinct things, but as different expressions of one and the same thing.

While the explanation of the remarkable conditions to be described is wrapped in mystery, it is certain that the changes in the extremities may start as early as the fifth or sixth week of fœtal life when the earliest structures of the digits are being formed. It is more difficult to date the commencement of the skull deformity, but it would seem to depend on a lack in the blasternal fœtal vault leading to premature closure of sutures. This has been found in the new born. Park and Powers drew attention to certain similarities between the defects of the head and those of the extremities.

1. The malformation of head and extremities are both regional defects involving soft tissues as well as bone.
2. In both skull and the skeleton of the hands and feet the striking lesion is synostosis, pathologic in the case of the extremities, because it ought never to have occurred, pathologic in the case of the skull because of its occurrence before its time.
3. In both skull and extremities those parts developed last (the vault of the skull, the ends of the extremities) appear to be most affected.
4. In the distribution of the deformities in the skull and extremities there is exhibited a common tendency toward symmetry.

Atrophy of the cerebral convolutions and increased intracranial pressure are said to be invariable, though the *modus operandi* of the latter is not certain. Internal hydrocephalus was present in some cases. This may be the reason for the increased cranial capacity of the two under review.

Greig[3] has recently drawn attention to the fact that there are several grades of oxycephaly and he divides it into three varieties.

(i) True oxycephaly, recognizable at birth and due to general cranio-facial synostosis. It is often associated with syndactyly and allied deformities of the extremities.

(ii) Delayed oxycephaly, a premature general synostosis of the cranium manifesting itself in childhood and not associated with deformities of the extremities.

(iii) False oxycephaly, a localized cranial synostosis occurring during cerebral growth. It is not congenital and is often of definite known origin.

This author describes the disturbance in true oxycephaly as embryonic and as taking place during the formation of the fingers and may be continued during the completion of the joints. The curious fact that where the skull bones touch, they fuse, he regards as the crux of the matter. In delayed oxycephaly synostosis comes later and the deformity may be striking, but need never become obtrusive. Ultimately true oxycephaly consists in the total obliteration of all the skull sutures, facial as well as cranial.

The possible relationship of acrocephaly to other varities of cerebro-cranial change such as mongolism, acromegaly, hypertelorism, is a fascinating subject, but is too theoretical for discussion at present. A mere case description must suffice.

M.S. is twenty years of age. A.B. is twelve years of age. Both are females.

Family History.

No details of the family history of M.S. are available.

A.B. is the fourth child of five, of whom the first, aged eighteen years, is still alive; the second and third were twins and died at the age of ten months of a wasting disease; the fifth was still-born. There is no history of similar abnormality in the family.

Past History.

A.B. is a full-time child weighing four kilograms (nine pounds) at birth. The head was noted to be large at birth. The mother states that a large quantity of water came away and she was very "big." Hydramnios was probably present.

The pregnancy was uneventful, except for a shock at three and a half months, after which there was a threatened miscarriage.

Mental State.

M.S. is a cheerful low grade imbecile, somewhat untidy. She helps in the ward at simple duties. Her intelligence quotient is 14.5.

A.B. is a contented high grade imbecile with an intelligence quotient of 60. She attends school and in spite of her deformities does excellent handwork.

Physical Examination.

M.S. is fairly nourished; her weight is 35·946 kilograms (five stone nine and a quarter pounds) and her height is 151 centimetres (four feet eleven and a half inches).

A.B. is well nourished; her weight is 42·677 kilograms and her height 146 centimetres (four feet nine and a half inches).

In both there are no abnormalities except in the head, shoulders, hips, hands and feet. The Wassermann test with blood serum did not yield a reaction.

In both patients the head is extremely high (steeple head). The forehead rising steeply to a point, has a well marked horizontal groove just above the superciliary

Diameter.	Measurement in Millimetres.	
	M.S.	A.B.
Greatest length of head	156	172
Greatest breadth of head	158	161
Projective ear height (middle external meatus-vertex)	145	151
Nasion-Inion (base length)	151	156
B 1 auricular breadth	120	125
Interocular breadth	30	44
Horizontal circumference head-superciliary ridge..	487	521
Cubic capacity (after Berry[1]) (0·000337 head length − 11 × head breadth − 11 × head height − 11 + 406·01)	1,368	1,545

ridges. The occiput is almost flat and is level with the neck.

A skiagraphic examination of the skulls was made. In the skull of M.S. the ratio between the measurements nasion to the external occipital protuberance and the vertex to the occipital condyle is as 5½ to 7½. In the normal adult it is as 7 to 6½.

The base line of the skull, consisting of the roof of the orbits, sphenoid and cerebellar fossa, instead of lying in a fairly plane surface, has a distinct concavity in the region of the sphenoid, giving the impression that the skull has been forcibly compressed antero-posteriorly and has given way to a certain extent in the region of the sphenoid. The floor of the cranial cavity at this point, forming the roof of the sphenoidal sinus, is of bony formation, too dense for cartilage.

The *sella turcica* is normal. No sutures can be distinguished. There are several areas on the inner surface of the calvarium with signs of a localized rarefaction, generally associated with intracranial pressure, as though one had pressed forcibly with the thumb and left an oval mark. There is one of these areas on either side of the frontal bone, just above the orbit, one on the posterior edge of each parietal bone and a distinct one just anterior to the vertex.

The jaw is rather prognathous. Teeth are badly formed, the molars apparently having only one root each. There are two broken teeth in the right lower jaw, the first and second molars.

In the skull of A.B. the ratio of measurements taken between nasion and the external occipital protuberance and between the vertex and occipital condyles is as 6½ to 8½. The base of the skull is practically normal, no concavity of the sphenoid being seen as in the other case. No abnormality of the *sella turcica* is detected. The inner surface of the calvarium shows no areas of rarefaction such as seen in the skull of M.S.

The parieto-occipital sutures can be made out, but the other sutures are indistinguishable. The jaw is normal and the teeth well formed. The frontal sinuses are well developed.

The ears are large and protruding. The external auditory meatus is well below a horizontal plane drawn through outer canthus.

The nose projects abruptly from the face in beak fashion at a lower level than normal. In M.S. the lower lip protrudes, whereas in A.B. it is the upper lip. Her mouth is small and is open when at rest.

The eyeballs protrude; this is more evident in M.S. The transverse axes seem to incline outward and slightly downward. The palpebral aperture is oblique, the external canthus being at a lower level.

Dr. R. Pittar reports: M.S. has irregular but equal and active pupils, a gross refractive error (myopia) and divergent strabismus of the left eye. The fundi are normal. The orbits are shallow. The orbits of A.B. are shallow; her eyes protrude somewhat, but there is none of the other abnormalities.

In both M.S. and A.B. the palate is high and narrow. Gross deformity of the upper jaw existed in M.S. for whom Mr. Champion carried out extractions in order to widen the arch and to help the patient to talk more lucidly. He has reported as follows:

Comparing the photographs of the two models, some idea of the space gained can be estimated. The models were obtained at an interval of eighteen months. The models reveal the following peculiarities: The first model of M.S.—The anterior four teeth are definitely bicusped. The canines are unerupted. The posterior teeth are abnormally placed. On the right side the second bicuspid, six year and twelve year molars are placed in a lingual to buccal direction, instead of antero-posteriorly. On the left side the six year and twelve year molars are placed in a similar manner.

The second model of M.S. was taken after eighteen months. The left canine has erupted; the right canine is unerupted and impacted. On the right side the three abnormally placed teeth have been extracted and the wisdom tooth has come down into place. On the left side the twelve year molar is in position and the wisdom tooth is about to erupt.

The model of A.B.'s mouth reveals none of these abnormalities.

The shoulders of M.S. are symmetrical; the acromial process is distinctly seen under skin. Internal and external rotation movements are normal. The arm can be abducted 30° without movement of the scapula. Abduction above the horizontal is impossible. On palpation the anterior end of acromion is felt to be very much more massive than the posterior and is rotated so that instead of the antero-posterior plane being horizontal, it slopes, the former being nineteen millimetres above the latter. The tip of coracoid process is felt with unusual ease. The ligaments of the shoulder joint are lax and the head of humerus can be pushed forward and upwards to form an abnormal prominence below the clavicle.

The appearance of the shoulder of A.B. is similar, but the abnormalities are less evident. Abduction to 40° is possible without scapular movement and the arm can be extended 30° above horizontal.

A radiological examination of the shoulder girdle of M.S. was carried out. The acromion process on either side is enlarged, the coracoid process is small and the glenoid cavity is small and shallow. The neck of the scapula does not project beyond the outer edge of the scapula, but is flush with it. The humerus on either side has dropped about twelve and a half millimetres and there is a forward dislocation on the right side. The head of the humerus is flattened and almost square.

The radiological examination of the shoulder girdle of A.B. revealed that the acromion process is enlarged. The head of the humerus is flattened and rather square in outline. The glenoid cavity is rather small and is almost flush with the outer edge of the scapula on the right side.

M.S.'s hands are symmetrical. The fingers are fused, the dorsal aspect is conical and the palmer surface concave. Movement is very limited. Two nails only are present, that for the little finger is separate, whereas the others combine to form one large semicircular nail. The thumb is broad and squat and curves outwards. It can be opposed; its nail is broad and narrow.

The above description is applicable to the hands of A.B., except that in the left hand the index finger has been separated by surgical means. As movement is very limited, the operation seems to have been hardly worth while.

In a skiagram of M.S.'s hand and wrist it is seen that the styloid process of the ulna is separate on both sides. The first row of carpal bones is normal, but the second row consists of two only, a normal trapezium and another bone consisting of the combined trapezoid *os magnum* and unciform. The metacarpals are normal. There is only one phalanx of the thumb. The proximal phalanges of the four fingers are fused at their distal ends into one mass of bone. This description applies to both sides.

In the left wrist of A.B. the styloid process of the ulna is seen to be separate; the right is normal. The bones of the carpus are normal. The first metacarpal bone is normal in length, but is malformed at the distal end. The second, third, fourth and fifth metacarpal bones are separ-

ate and normal. The phalanges of the fingers are fused into one mass at their distal ends. This is in the right hand. In the left hand some attempt has been made to form a useful hand, the phalanges of the middle finger have been removed, thus separating the index finger from the mass. The distal ends of the phalanges of the fourth and fifth fingers remain fused together.

There are no gross abnormalities in the pelvis of either patient. The leg can be abducted to an angle of 40° in M.S. and 45° in A.B.

In a skiagram of the pelvis of M.S. the inlet is seen to be rather flattened from before backwards. The acetabula face in a more anterior direction than is usual, so that the necks of the femora appear foreshortened in the picture. The trochanters are completely fused with the shafts.

A skiagram of the pelvis of A.B. revealed that the great trochanters have not yet fused with the shafts of the femora and are larger than usual, extending as high as the highest point of the heads of the bones. The innominate bones have not quite fused to form the acetabula.

The feet of M.S. are alike in appearance. She is flat-footed. The four outer toes have the appearance of being run together, with the line of junction just visible as shallow skin furrows. The nails are distinct and contiguous. The great toe is extremely small and squat, possessing but a fringe-like nail. Movement of the phalanges is slight.

The feet of A.B. differ from the above in that there is a normal arch. The four outer toes, though joined together, are longer and move more freely. The great toe, though short, is more normal in appearance and has a larger nail.

The skiagrams of the feet of M.S. are approximately the same on both sides. The astragalus and *os calcis* are distinguishable, but are partly fused together. The rest of the tarsus is fused into one mass. The first metatarsal bone articulates with the internal cuneiform bone, but is fused to the second metatarsal by a bridge of bone. The other four metatarsal bones are fused to the tarsal bones. There is a distinct supernumerary ossicle at the base of the fifth metatarsal bone. The first metatarsal bone is only half the length of the second and has one phalanx which extend to the distal end of the second metatarsal bone. There are two phalanges of the second toe. The phalanges of the third and fourth toes are fused into one mass.

The bones of the tarsus and metatarsus of A.B. are normal with the exception of the formation of separate ossicles at the base of the fifth metatarsal bones. There are two phalanges to the great toe, but they are malformed and spatulate. There are two phalanges to each toe with distinct articulations. There is no fusing of the toes together as far as the bony construction is concerned.

Acknowledgements.

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(1) R. J. A. Berry: THE MEDICAL JOURNAL OF AUSTRALIA, September 12, 1925, page 352.

(2) Edwards A. Park and Grover F. Powers: "Acrocephaly and Scaphocephaly with Symmetrically Distributed Malformations of the Extremities," *American Journal of Diseases of Children*, October, 1920.

(3) Dana M. Greig: "Oxycephaly," *Edinburgh Medical Journal*, April, May, June, 1926.

SOME GASTRO-INTESTINAL DISORDERS OF CHILDHOOD.[1]

By EDGAR H. M. STEPHEN, M.B., Ch.M. (Sydney),
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THE treatment of gastro-enteritis has been modified so much recently that I considered you might be interested in an account of the various methods now generally used at the Royal Alexandra Hospital for Children. It is no doubt true that the great majority of patients with gastro-enteritis respond rapidly to a few days' correct treatment, but there are the few which can cause the medical attendant much anxiety and demand the exercise of all his resources. I hope, therefore, a survey such as this will not seem inappropriate. General medical practice obliges us to be interested in the chronic vomiting of infants which subject will make a brief addendum to the detailed discussion of gastro-enteritis.

Gastro-Enteritis.

We were told in New Zealand last year that gastro-enteritis was practically non-existent there nowadays. I presume that it is a resistance to disease achieved by their methods of promoting infant welfare that is responsible for this happy state. To some extent their climatic conditions may be considered more favourable than ours in the prevention of summer disorders.

To begin with there is a form of diarrhœa of simple origin which is deserving of recognition and which yields easily to the correct treatment. I mean that form associated with dentition. I am one of those who believe in lancing for teething and I am sure that an examination of the gums of an infant whose nights have been restless, with a history of diarrhœa and the passage of stools distinguished by a peculiarly offensive odour, will often suggest the use of a scalpel. I remember children who had repeated convulsions until their gums were lanced, when relief was immediately obtained. It is not difficult to believe that a diarrhœa in summer or a bronchitis in winter can likewise be caused by dentition. I have found it an advantage to separate the mucous membrane from the anterior and posterior aspects of the tooth as well as incising over the cutting edge.

It is advisable to distinguish gastro-enteritis from ileo-colitis or dysentery as far as is possible. Frequently neither history nor symptoms aid such distinction and in most cases the treatment of both conditions is identical. Gastro-enteritis is distinguished by symptoms which suggest irritation rather than inflammation with superficial changes in the parts affected. The symptoms are pain, pyrexia in early stages, numerous liquid motions which become green owing to the presence of biliverdin.

Ileo-colitis is the term applied to that form of diarrhœal disease in which there are stools with

[1] A British Medical Association lecture delivered before the Eastern District Medical Association, Port Macquarie, March 31, 1928.

much blood and mucus and which results from infection with a definite bacterium. In ileo-colitis the abdomen may be full and distension of the colon is sometimes obvious. Straining is usually present, at any rate in the early days of the attack. Pathological examination of the stools may yield cultures of Flexner's bacillus, Shiga's bacillus, *Bacillus enteritidis et cetera*. These diseases are indeed hot weather complaints, against which breast feeding is the greatest safeguard for the infant and careful adjustment of diet for the artificially fed.

It has been found in diarrhœal disease that the duodenal enzymes are definitely reduced in activity in many cases. Perhaps the loss of water natural in summer weakens the child's resistance and causes this reduction in activity in the upper part of the small intestine. Food stagnates in this region and affords an excellent culture medium for bacteria which produce irritating products from the fats and carbohydrates. Diarrhœa may cause six hundred cubic centimetres of water to be lost in the stools daily and soluble salts, particularly sodium chloride, to be drained away from the tissues. Holt in his work on diseases of children gives this very reasonable view with various confirmatory proofs and accounts of various biochemical tests.

Prognosis.

For patients over the age of twelve months the prognosis is good. The younger the infant the greater the risk. A good intake of fluid, for example, nine hundred cubic centimetres (thirty ounces) in the twenty-four hours, is a hopeful sign.

Dehydration is a sign of a severe infection. The eyes are sunken, the fontanelle depressed, the skin dry and inelastic. The symptom of restlessness is a cause for anxiety and the occurrence of definite acidosis with diminished excretion of urine, the patient being restless and licking his dry lips, vomiting continually and exhibiting air hunger, only too often predicts a fatal issue.

Treatment.

First eliminate offending material by administering four to eight cubic centimetres (one to two drachms) of castor oil, calomel in small repeated doses or sulphate of soda. If sulphate of soda is used, give it every four hours in doses of 1·2 grammes (twenty grains) for a patient of six months, two grammes (half a drachm) for an infant of nine months, four grammes (one drachm) for a child of two years. Given in a mixture with *extractum glycyrrhizæ liquidum* and *aqua chloroformi*, the sulphate is a drug children tolerate well and the dose is estimated to produce watery stools. For children under six months *magnesii carbonas ponderosus* may be used in place of sulphate of soda. Personally I continue the use of an aperient for several days until the symptoms are relieved and while pyrexia persists. Its use is contraindicated if dehydration is definitely present. The continuance of eliminant drugs after the initial dose is by no means a general practice. Many consider they serve no useful purpose and have abandoned their use. In the later stages of the disease preparations of bismuth are often of some assistance. Colonic irrigation is useful to relieve distension and is more effective when accompanied by a hypodermic injection of 0·5 cubic centimetre of "Pituitrin." Irrigation often relieves the tenesmus of ileo-colitis. The routine use of irrigation is very exhausting to the little patients and has not proved as beneficial as was once claimed. It is best reserved for occasions when specially indicated. Antidysenteric serum is often of great benefit; thirty cubic centimetres of serum are given in the first two days of an attack when straining is present and when much mucus and blood are passed and a dysentery indicated thereby. The injection may be repeated on the two following days. Unless given early, it is not likely to prove of use and in mild cases it is hardly necessary.

For dehydration and for patients who will not take even water or who vomit persistently, the use of intraperitoneal injections of saline solution is a most valuable weapon. The apparatus required for this operation is a serum needle with the point ground down, the barrel of a glass syringe connected by about a metre (three feet) of rubber tubing. It is hardly necessary to use a local anæsthetic for the site of puncture. A point in the midline a little below the umbilicus is sterilized and the peritoneal cavity entered with the saline solution flowing. It is important to see that the solution is flowing, as it obviates the risk of trauma to the bowel which it pushes before it as it flows. In these types of case the bladder is seldom found to contain much urine. Catheterize if necessary as a preliminary. The abdomen may be filled comfortably at one session when as much as two hundred and seventy cubic centimetres (nine ounces) may be conveniently instilled. Repeated infusions of one hundred and twenty to one hundred and eighty cubic centimetres (four to six ounces) usually prove of more lasting benefit. It is doubtful if the addition of glucose to the saline solution is an advantage. There is another important point and that is that the patient's shoulders should be well raised. The lower part of the abdomen tolerates the entrance of the fluid better than the upper part and shock is apparently obviated by this manœuvre. Transfusions of citrated blood by this method are at times of great value. In debilitated marasmic infants whose condition is the sequel to gastro-enteritis, blood transfusion has made a rapid transformation. The blood of recipient and donor must be typed in the usual manner.

For collapse immersion in a mustard bath or packs wrung out and applied for fifteen to twenty minutes are of value. For these purposes use a tablespoonful of mustard to four and a half litres (a gallon) of water. For restlessness the most effective treatment is the use of hypodermic injections of morphine. *Tinctura opii* and *pulvis ipecacuanhæ compositus* may be substituted, but as vomiting frequently accompanies restlessness, hypodermic injections are more satisfactory. A very

small dose, for example 0·6 milligramme (one-hundredth of a grain) for a child of six months is usually sufficient and this can be repeated in a few hours; one milligramme (one- sixtieth of a grain) repeated at longer intervals may be preferred. A draught of chloral with potassium bromide is not usually so successful. The use of tepid packs helps in restlessness of a minor degree. For vomiting administer small quantities of solution of bicarbonate of soda (seven grammes to a litre or one drachm to a pint) frequently.

Diet.

After the patient has been for the first day on water only, barley water, whey and water or albumin water may be used. Then Benger's food made on water or Benger's food made on whey, water gruel, condensed milk (one in twenty) or cow's milk diluted with three times as much water may be given. Later Benger's food or other cereals and "Sao" biscuits are suitable. For increasing the diet be guided by the temperature chart and general aspect of the patient. Fat is the last item to be added to the diet and it should be increased cautiously. Holt and others mistrust whey "owing to its high sugar and salt content." My experience with whey has encouraged me to persist in its use and it is usually taken more readily than most of its rivals. Wine whey is to be preferred to rennet whey if vomiting is troublesome. It is risky to continue a diet of very low caloric value for more than two or three days. While discussing diet, I would like to mention lactic acid milk and its usefulness in marasmus. Made with Faulding's "Lactose Syrup," it is quite palatable. Its preparation needs care: thirty cubic centimetres (one ounce) of the syrup are added to five hundred and sixty-eight cubic centimetres (one pint) of milk. First boil the milk for five minutes. Allow it to cool. Add the syrup drop by drop, stirring five or six times after each addition. When using, just make it warm, but do not heat.

Chronic Vomiting in Infants.

I have no intention of referring in detail to the more obvious causes of chronic vomiting in infants, such as too liberal feeding, too frequent feedings, the use of cow's milk for children whose stomachs resent and reject its curds, and those who show an idiosyncrasy against fat or carbohydrate foods. I intend to refer very briefly to those patients who have been admitted to hospital with a history of chronic vomiting.

An appreciable number have been found to cease vomiting when kept entirely quiet in their cots. They are worthy of mention, as so simple a method of cure is decidedly not obvious. A hurried mother and too energetic nursing have apparently caused the symptom.

Next comes the type that requires dilution of its feedings and the use of sodium citrate. This type vomits tough curds with great regularity.

Then for conditions simulating pylorospasm gastric lavage, repeated daily if necessary and doses of solution of atropine (one in a thousand) given just before feedings are the best means to adopt. Two or three drops of this solution are increased as proves necessary. The limit of tolerance is indicated by flushing of the skin.

Pyloric stenosis with its projectile vomiting, visible peristaltic waves, wasting, constipation and diminished urine is a condition calling for the surgeon.

There is a class of infant who at as early an age as three months will best respond to a diet of thickened cereal. The cereal may be rendered so thick that the food can be administered only with a spoon. There are two reasons probably why this food has its triumphs. First, the intake of food is exceedingly slow and no rapid demands are made on the infant's digestion. Secondly, carbohydrates begin to leave the stomach soon after their ingestion (within ten minutes). Thus the gastric functions are employed on a slow and easy grade and the bulk of gastric content is kept at a low point. The most palatable cereal of this type is made with baked flour and we find the infants take it very willingly. The recipe from the diet kitchen is as follows:

Tie six cups of flour in three cloths. Place in cold water and allow to boil for six hours. Peel off wrappers and outside dough. Break up chalky centre and put through mincing machine and then through flour sifter. Place the ground flour in a baking dish and bake till pale brown. Keep in air-tight tin.

Ingredients:

Cow's milk 360 cubic centimetres (twelve ounces)
Water 240 cubic centimetres (eight ounces)
Sugar ten grammes (one-third of an ounce)
Butter fifteen grammes (half an ounce)
Baked flour fifteen grammes (half an ounce)

Method of preparing: Place butter in double saucepan. Melt until pale brown. Add baked flour. Stir together until brown. Add milk, then water and sugar. Cook in double boiler for thirty minutes.

The percentage composition per thirty cubic centimetres (one ounce) of this mixture is: Carbohydrates 6·5, fat 4·1, protein 2·4. The caloric value per thirty cubic centimetres (one ounce) is 21·3.

To render this food thick, as much as sixty grammes (two ounces) of baked flour may be added to 568 cubic centimetres (one pint) of the mixture. This will be sufficiently thick to necessitate spoon feeding.

I have been liberal with details, but the treatment of children's diseases depends so much on detail for its success that I felt it was the right course to adopt.

CANCER CONSIDERED HISTORICALLY.[1]

By H. M. MORAN, M.B. (Sydney), F.R.C.S. (Edinburgh),
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"The past more clearly resembles the present than water resembles water."

WHEN we peer into the mists of primitive medicine we find but vague and infrequent references to

[1] Read at a meeting of the Section of Medical Literature and History of the New South Wales Branch of the British Medical Association on April 24, 1928.

cancer. The term itself goes far back into antiquity and was doubtless first applied to malignant disease of the breast in which form one may in imagination perceive the shape of a crab, its destroying tentacles spread wide.

In the Ebers papyrus (*circa* 1552 B.C.) ulcerated tumours are written of but only in a passing way and the notions are drawn from Hindu poems. We must come down to the records of a great school and a great tradition (that flowering of Ionian genius) which are retained under the name of the Hippocratic collection in order to read of Carcinos and Carcinoma, of new formations which do not grow better and of malignant tumours. The hard cancers and the open cancers are distinguished; cancers of the uterus, breast and stomach are described. Melæna is appreciated as a valuable sign in diagnosis. Prognosis is discussed and the principle laid down that the outlook is much less grave when treatment is begun betimes and in women before the menopause. Thus even from Cos comes the echo of a voice crying in the wilderness for early diagnosis.

A century passes, Medicine leaves its Grecian soil and passes across to Egypt where Alexandrian masters sow broadcast the seeds of Greek learning. No brilliant new shoots spring from the transplanted plant. But with the decline of the Alexandrian school a root striking at Rome bursts into flower with the radiance of Celsus and Galen. In the first systematic treatise on medicine which has come down to us, that of Celsus, is to be found a classification of tumours and of cancers properly called the ulcer, the scirrhus, latent cancer, occult cancer, and thymium or *cancer apertus*, the exact sense of which still escapes us. Galen, of Pergamus, "the greatest master of scientific method from the second century to Roger Bacon," sought to enlarge the Hippocratic doctrines to which for the most part he remains a faithful disciple. In his "Treatise on Tumours" he describes three kinds: the tumours according to Nature (such as the breast at puberty and the pregnant uterus), tumours exceeding Nature (such as callus) and tumours contrary to Nature (such as neoplasms or humoral tumours). These last mentioned may be benign or malignant. Their origin is attributed to the atrabile and melancholia of women; the menopause and hæmorrhoids are given as frequent causes, through a failure in the evacuation of the black bile. In extirpating the growth, care was to be taken to purge the wound of its containing blood and to cauterize it with the red hot iron.

Galen died in 201 A.D. and for a time three schools of medicine hold the stage, those of Athens, of Rome and of Alexandria. The Roman Empire falls and for several centuries there is eclipse. A period of arrest; and then after the fall of the empire of Charlmagne out of the darkness glimmers the brightness of Arabian medicine to illumine during the seventh and eighth centuries the science and art, the philosophy and letters of Europe. For, as Browne says, the Arabs took the flickering torch of Greek medicine and if they failed to restore it to its former brilliance, at least they kept aflame its sacred fire and five centuries later they handed it back burning more brightly than ever.

There appeared four great books during this golden age of Islamic medicine: the "Paradise of Wisdom" of Rabban, "The Continens" of Rhazes, the *"Liber Regius"* and the "Canon of Medicine" of Avicenna.

In the eleventh discourse of the "Paradise of Wisdom" Ali Iba Rabban treats of tumours and cancers. Avicenna in his "Canon of Medicine" tells us that contrary to ancient belief the brain and the bones may be the seat of tumours. He recommends for treatment a decoction of certain plants, purgation and bleeding and lays the basis of arsenical therapy. But on the whole the influence of his "Canon" was for evil for, as Campbell says:

> It confirmed the idea that the use of syllogisms was better than first hand investigation and it slowed down the progress of surgery by suggesting that it was beneath the dignity of physicians to practise the manual art beyond the use of the cautery and caustics.

In the eleventh century the school of Salerno lifted the standard of European medicine from the mire of magic into which it had sunk. The physiology and the pathology of this school were Galenic and its diagnosis rested on pulse lore and urine lore. Ruggiero or Roger wrote a treatise on medicine in four books in which he counselled wide excision in early cancer and abstention for those cases which were already advanced.

There are many interesting figures fretting their little hour upon the stage of the middle ages. We see Lanfranchi, victim of the squabbles of Guelph and Ghibberline, a fugitive from Milan. He it was who first distinguished breast cancer from simple mastitis. John of Arderne, the blonde-bearded Saxon, in gown and cap is seen seated on a throne-like chair, Henri de Mondeville, sharp featured and grey haired, is in a purple gown of clerical cut. He recognized cancer of the glands and placed the causation in melancholia. Roger Bacon, English Franciscan and versatile genius, Guy de Chauliac, the most erudite surgeon of his time, critic and historian, are there. But all these wrote little of cancer and that little was seldom new.

The fundamental error of the middle ages was the divorce of surgery from medicine. It was a sterile period for internal medicine. The practice of surgery was left to the mercy of barbers and itinerant mountebanks. There is no new light in cancerology, the old Greek conceptions remain and over all hangs heavily the fog of the humoral theory.

With the Renaissance the wind of a new inspiration stirred the dust of the old scholasticism. There came a quickening of the spirit of investigation and a groping after new facts.

Paracelsus, Vesalius and Paré are great figures bestriding the sixteenth century. Paracelsus bounds into our presence, tilting at established beliefs. He boasts bombastically of his ignorance of science and essays to replace the need for knowledge by a

theosophical intuition. He publicly burns the heavy tomes of Galen and Avicenna. For Hippocrates alone he has respect. Cancer is due to a mineral salt in the blood and this elusive salt seeking its way out creates a tumour wherever evacuation is faulty. Paracelsus synthetizes the empiric tendencies of his epoch. Van Helmont and Silvius de la Boë follow, taking his ideas and modifying them. At least it can be said of the iconoclast Paracelsus, he broke the idols of Galenism and the four humours and he taught a reverence for chemical therapeutics to those who had worshipped alchemy.

Vesalius, studying the true bible of the human body, made of anatomy a living science. He spurned the Galenical superstitions and disposed for all time of Galenical ideas in osteology and muscular anatomy. He noted the identity of nature in closed and open cancer and his pupil Fallopius disposed of the false belief that arterial and venous arborizations were pathognomonic of cancer. Fallopius, too, it was who noted that the indurated and everted edges of stomach ulcer were suggestive of malignant transformation.

The works of Paré are full of references to cancer which he describes under the name of *"Tumeur chancreuse,"* writing in French where all his famous predecessors had written in Latin. This country barber's apprentice from the provinces whose name was to be grouped with those of Hunter and Lister in the trinity of immortal surgeons, added little, however, to the small stock of the knowledge of cancer. He classified tumours according to their size and colour, to the pain they caused, to their consistency and the material of which they were engendered. For the non-ulcerated tumours he proposed bleeding to purge the melancholy humor and sought by provoking menstruation in the women and hæmorrhoids in the men thus to rectify the intemperance of liver and spleen.

The flood tide of the Renaissance in medicine is felt in the seventeenth century. Harvey, always a Royalist and later much of a recluse, startles the world with his *"de Motu Cordis."* Leeuwenhoek perfects the lenses and the microscopists, Kircher and Hooke, see new planets swim into their ken. Malphighi, greatest of them all, investigates methodically the structure of tissues and organs and founds the science of microscopic anatomy. European medicine for the time is dominated by three great philosophers, Van Helmont, Descartes and Leibnitz and by the three great schools, the iatro-chemical, the iatro-mechanical and the vitalistic or animistic.

A few practitioners only escape the malady of the time and adhere to Hippocratic methods of observation and experience. Among these is the archetype of English medicine, Thomas Sydenham, the trooper turned physician, whose good sense, good humour and piety added riches to medicine and brought glory to his race.

The eighteenth century dawned on a world full of the confusion of endless theories and systems, but medicine was to mine rich ores from the genius of Mortgagni, John Hunter and Jenner. Giovanni Mortgagni, as Virchow says, made pathology a genuine branch of science. Unfortunately he interested himself little in the study of tumours. It was John Hunter who raised English surgery from obscurity and opened a bright era the fame of which Lister was to enhance a hundred years later. Before Hunter there had been but two great clinical surgeons in London, William Cheselden, equally at home dealing with an iris or a bladder, and Percival Pott who was proud to say later that, boy and man, he had served Saint Bartholomew's for fifty years. John Hunter took and modified the Cartesian concept of the origin of cancer. But it was no longer a coagulated lymph as Descartes saw it, but a lymph sweated from the blood.

For the first time tumours came to be looked on as playing an integral part in the life of the organism, on the same footing as normal tissue. These new formations, classified into soft, hard and hæmorrhagic tumours, were at last considered as being alimented like other tissues by the circulation, whence grew the idea that to combat these growths it was necessary to constrict the nutrient vessels. To John Hunter also goes the credit of first pointing out the social menace of cancer.

If at this stage we turn in our ascent and look back on the pilgrimage of medicine from ancient times to the end of the eighteenth century, from Hippocrates to Bichat, we perceive how little the conception of cancer had varied. Its structure, gross or minute, remained unknown, its pathogeny obscured by the idea of the local deposit of a humour. Little does it matter if that deposit consist of a humour that never existed or of a normal constituent of the body, such as the lymph of Descartes and Hunter, its rôle was no less fictitious.

Certainly with the march of years there had come a greater precision into the description of growths. It is difficult to estimate in the writings of early medicine how many different and totally diverse conditions were gathered together in the hotchpotch which was called cancer. Then, as now, the less scrupulous physician was not above dignifying with the diagnosis of cancer some trivial malady in order to win an unmerited glory from its cure. Incurability remains the one safe criterion. Even when extensive ulceration existed, there was frequently a confusion with the graver forms of syphilis. The vaunted efficacy of quicksilver in malignant disease thus finds a ready explanation. Has not Guy de Chauliac praised it and Ambrose Paré confirmed the recommendation?

There was a concerted effort on the part of French surgeons and academicians in the early part of the eighteenth century to introduce a nicer precision into clinical description. In 1704 the lipoma was described by Littré and in 1757 Ledran classified a large number of cancers of the skin.

It remained for Bichat to give a new orientation to medicine when he founded a line of morbid anatomists. At last there was a peering at the lesion behind the disease and an effort made to climb on the stepping stone of our dead selves to a higher knowledge of morbid processes. The latter

part of the eighteenth and early part of the nineteenth centuries are brightened by the lustre of the name of Xavier Bichat, anatomist, physiologist and surgeon. Tissue was his absorbing study, tissue, its form, structure, development, properties and function. His word pictures of the macroscopic appearance of many cancers have not aged with the years; the scirrhus still cries under the scalpel. The hypothetical causal humour of the ancients is cast aside and he sees cancer for the first time as a tissue, an accidental tissue resembling the normal, a tissue, but a unity apart. The "creator of descriptive anatomy" died like his successor in the adventurous youth of his mind, but he left a great inheritance which Laënnec was still further to enrich. René Théophile Laënnec concerned himself less with the form and seat of lesions than with the texture of the tissues. In his *"Essai sur l'Anatomie Pathologique"* and in his articles in the *"Dictionnaire des Sciences Médicales"* he discussed at length various cancers. He showed that the scirrhus and the soft cancer were different diseases and not successive stages of the same tumour; he noted the phenomenon of metastasis, but adhered to the opinion that cancer is an alien tissue without analogue in the human economy. Broussais "whose methods of teaching were Napoleonic and whose therapeutics sanguinary," pursued Laënnec even to the grave with a violent hatred. In his *"Histoire des Phlegmasies ou Inflammations Chroniques"* Broussais elaborated the irritative theory of the causation of cancer. He considered the initial process one of chronic inflammation involving particularly the lymphatic capillaries. The repetition of irritation exasperated the tissues into the ugly mood we know as cancer. Some of the aphorisms from his *"Examen des Doctrines Médicales"* have an arresting interest. "Every inflammation and sub-inflammation," he wrote, "can produce cancer," and again "if you wish to prevent the cancer of the uterine neck which occurs at the critical age in women who have had painful menstruation, it is necessary to allay the irritability of the womb long before that time is reached."

Cruveilhier in 1827 distinguished two "organic degenerations" which were grave lesions characterized by the transformation of normal tissue into morbid tissue without analogue in the body. The first of these which he named *"gélatiniforme"* and which corresponds to our colloid cancer, he maintained was not really malignant. The second degeneration was a morbid parasitic tissue containing a characteristic *"suc"* or juice, *"blanc, crémeux, galactiforme miscible à l'eau."* Here was the pathognomonic sign of true cancer.

With Cruveilhier closes another chapter in the history of cancer, a chapter of macroscopic pathological anatomy. It covered a period much more scientific than the preceding one and yet for all its brilliant names was not fruitful in great achievements beyond the careful investigations of Bichat and Laënnec and the intuitive speculations of Broussais. But cancer was no more a tumour; it was proclaimed and accepted as a tissue. Its nature, of course, remained unexplained and its relations to the organism not understood. There were many gaps in the knowledge of tumours and not infrequently the physicians of the time masked their ignorance with obscure theories and newly coined, awkward terms of Greek origin.

A new phase began with the development of microscopic anatomy and pathological histology. Johann Müller affirmed in 1838 that tumours and cancers were formed of cells and elements similar to those normally existing in the organism. Lebert and other French histologists stoutly defended the older beliefs of Laënnec and Cruveilhier than cancer was a tissue alien and apart, without analogue and formed at the expense of some vascular exudation. Virchow completed the work of his master and compatriot and established the modern belief that malignancy is merely an error of site; the tissue is not alien, it has merely broken bounds. The old axiom of Harvey, *"Omnis cellula e cellula,"* was revived. The jumping-off ground for cancer according to Virchow was the connective tissue, the elements of which returned to their embryonic state whence any cellular structure whatever could be reproduced. For the local origin of cancer he accused irritation. Generalization and the formation of metastasis were brought about by the power of the cancer juice which on certain elements acted in a manner akin to insemination; but in the actual transference of cellular elements he did not believe.

Virchow's long and valuable life overlaps our own time. His death came at the dawn of the present century which has already been prolific in new discoveries. The transplantation of cancer from animal to animal had been realized by Klenke in 1843 and in the present era the experimental study of cancer has opened up new veins of promising richness. Here the names of British investigators, sadly few in the early centuries of cancer work, are legion and notable. We must never forget that before John Hunter had died the bequest of John Howard had laid the corner stone of cancer work at the Middlesex Hospital, whose charter is a pattern for mankind and a monumental achievement in social medicine. For it must be remembered that hitherto the cancer patient had been shunned as a pariah in whose face the hospital doors were always slammed. The Middlesex Hospital provided at once an asylum for the afflicted and a laboratory for research into the cause and cure of cancer. Thus was added to the crown of British medicine a jewel which ranks with such discoveries as those of vaccination, antisepsis and anæsthesia.

In 1895 Röntgen discovered the X rays and later Madame Curie isolated radium from pitchblende. Strange portents these, the real significance of which we cannot yet appreciate.

In this short sketch I have leapt lightly over continents and centuries and the history of cancer still finds the searcher following the light whither and to what new horizons we know not.

FIBROIDS AND PREGNANCY.[1]

By J. C. WINDEYER, M.D. (Sydney), F.C.S.A.,
Professor of Obstetrics, The University of Sydney; Honorary Surgeon, Royal Hospital for Women, Paddington.

As it is the duty of the chairman at our annual meetings to deliver an address which is to be followed by a discussion, I have purposely chosen a title which covers a fairly wide range. I propose to take into consideration tonight three main headings: Fibroids and sterility, fibroids occurring during pregnancy and the effect of pregnancy on fibroids. Whilst I cannot attempt to take all these headings in detail, I will point out to you what has been my experience in these conditions and describe a few of the more uncommon types.

Fibroids and Sterility.

Fibroids and sterility are most commonly found in the woman who marries late, that is from the thirty-fifth year onwards. She has been married for one or more years and consults a surgeon on account of her failure to conceive. She is intensely anxious to have children, she may or may not have symptoms of fibroids. On examination there is found an enlarged uterus which is irregular in outline and of hard consistency; most commonly the uterus contains multiple fibroids and these may be mostly subperitoneal or intramuscular, but usually one or more project into the uterine cavity. In my experience it is rare for a woman with fibroids to present herself with the complaint of repeated abortions.

Arthur E. Giles in his monograph "Sterility in Women" expresses the view that fibroids are not the cause but the result of sterility or, speaking more accurately, they are the result of the absence of pregnancy. He further produces figures to show that in 85% of cases of fibroids the patient has either not been pregnant at all or has had no pregnancy for at least ten years. If this theory of Giles be correct, we would expect to find an increasing proportion of fibroids in women owing to the common practice of contraception. I know of no figures in regard to this point.

Another question arises in regard to the association of fibroids and sterility since fibroids are often associated with tubal changes which in themselves are sufficient to cause sterility, and that is whether the fibroids caused the tubal troubles or whether the tubal troubles are the cause of the sterility which, as Giles suggests, gives rise to fibroids. It has been estimated that from 12% to 20% of all pregnancies terminate in abortion. In Giles's series 16% of the pregnancies terminated in abortion. It is a debatable question, therefore, whether fibroids cause abortion as frequently is supposed. During abdominal palpation in the later months of pregnancy if the anterior uterine wall is carefully and systematically palpated, small fibroids and often several of them are quite commonly detected. As the posterior wall of the uterus cannot be felt and as fibroids develope in any part of the uterine muscle, it is obvious that many of these small fibroids remain undetected. By small fibroids I mean those below 3·75 centimetres (one and a half inches) in diameter. I am certain, therefore, that fibroids are much more commonly associated with pregnancy than statistics would lead us to expect. These small fibroids are mostly intramuscular and project but slightly above the level of the rest of the surface of the uterus; they resemble somewhat the projections caused by the limbs of the fœtus, but limb projections alter their position with the movements of the fœtus, whilst the projection caused by a fibroid is stationary. The frequency of fibroids complicating pregnancy has been given by Pinaud as one in a thousand, by Schauta as one in one hundred and sixty; my impression is that if a careful search is made for fibroids, they will be found even more commonly than Schauta's figures indicate.

Fibroids Occurring During Pregnancy.

In my experience fibroids rarely cause trouble during pregnancy and it is but very occasionally that the question of hysterectomy during the early months of pregnancy has to be considered. The two following histories are of women in whom the growths by reason of their size and situation indicated operative interference.

Mrs. B., aged thirty years, married five months, was referred to me by Dr. Harriet Biffen during her first pregnancy with a diagnosis of pregnancy complicated by fibroids. The last menstrual period had commenced three months previously and the patient had been well since.

On examination a fibroid was felt filling the pelvis, the cervix was drawn up anteriorly out of the pelvis and a hard fibroid ten centimetres (four inches) in diameter could be felt just beneath the abdominal wall extending up almost to the umbilicus, the body of the uterus could not be felt. This case was one in which difficulty might be expected, as the fibroid in Douglas's pouch was of such dimensions that a slight increase in size would cause impaction and the other fibroid springing from the anterior wall of the uterus would tend to prevent the posterior one from rising out of the pelvis later on during pregnancy or labour and a Cæsarean section would have been necessary.

The probabilities of the case were put before the woman and her husband and they both emphatically favoured an operation with removal of the uterus and tumours. This was done a few days later and the pregnant uterus was found to be sandwiched between the two large fibroids, the fundus being directed towards the lower lumbar vertebræ. The condition is represented diagrammatically in Figure I.

De Lee in his textbook illustrates an almost identical case. Supravaginal amputation of the uterus was performed, both ovaries being left *in situ*.

I felt pleased that the patient had decided in favour of an operation, for the conditions present would have made treatment difficult, if an abortion had occurred. Myomectomy would have been risky in this case, as both fibroids had a broad attachment

[1] Read at a meeting of the Section of Obstetrics and Gynæcology of the New South Wales Branch of the British Medical Association on March 21, 1928.

to the uterus and the posterior one was attached low down on the posterior wall of the uterus.

Mrs. M., aged thirty-two years, was admitted to the Royal Hospital for Women with a history of being pregnant for the first time, the last menstrual period having commenced fourteen weeks previously.

On inspection the abdomen was enlarged to a size corresponding to a full term pregnancy. Palpation revealed an irregular nodular hard mass, somewhat the shape of a fœtus at term, the mass extended from the *symphysis pubis* up to the ensiform cartilage. *Per vaginam* the lower portion of the uterus was irregularly nodular. The diagnosis was that of pregnancy complicated by exceptionally large fibroids and as the enlargement was that of full term and as pressure symptoms were already present, it was decided to remove the uterus.

At the operation it was found to be impossible to remove the uterus with its attached fibroids until the incision had been prolonged up to within five centimetres (two inches) of the ensiform cartilage. A few loose adhesions to the anterior abdominal wall were easily separated, the mass eventrated and the uterus amputated supravaginally. The abdominal incision which was the longest that I have ever made, was stitched up in layers and healed by first intention. This was fortunate as the patient was very stout and when seen five years later the scar was sound throughout its entire length.

These two cases are the only ones in which I have deemed it necessary to remove a uterus in the early stages of pregnancy on account of fibroids.

I exhibit a pregnant uterus in the wall of which there are several small fibroids. This uterus has been removed by supravaginal amputation at about the sixth week of gestation; it is very questionable whether it should have been removed and personally I think the operation was unjustifiable.

Another specimen is that of a pregnant uterus in the wall of which there are a number of medium sized fibroids up to 6·25 or 7·5 centimetres (two and

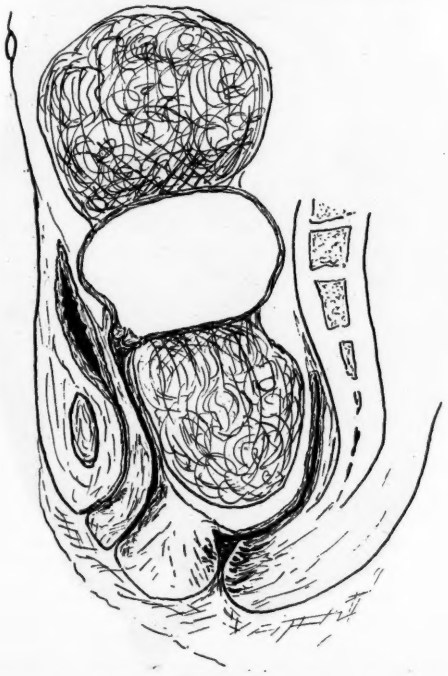

FIGURE I.
Diagram Showing Pregnant Uterus Sandwiched Between Two Large Fibroid Tumours.

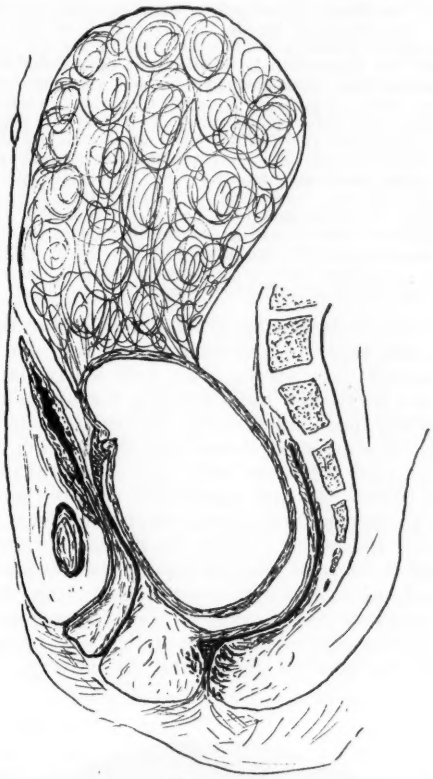

FIGURE II.
Diagram Showing Fibroid Tumour Attached to Anterior Wall of Pregnant Uterus.

a half or three inches) in diameter. In this patient, although I have no record of her history, the pregnancy had persisted up to about the twenty-sixth week; it is probable that she would have gone on to term when Cæsarean section or hysterectomy would have been performed. These two specimens were sent to the medical school about twenty years ago and it is probable that the surgeons who removed them, would today allow the pregnancy to continue till term.

Myomectomy during pregnancy has been performed by numerous operators, but I doubt whether any one has had a very large series of cases; if any one has, it is probable that he has done numerous unnecessary operations. Further, myomectomy during pregnancy has recently been shown to have an abortion rate of 23%.

My experience of myomectomy during pregnancy is limited to one case.

Mrs. M.W., aged thirty-one years, was admitted to the Royal Hospital for Women on August 9, 1924, with a history of amenorrhœa since March 21, 1924. She had been married for four months.

On examination a large hard rounded mass was felt in the upper part of the abdomen to the left side and extending ten centimetres (four inches) above the umbilicus; below it was attached to the softer pregnant uterus. *per vaginam* the cervix was found to be high up anteriorly and pressed against the lower part of the abdominal wall. The condition is represented diagrammatically in Figure II. Owing to the position of the cervix and the large

size of the fibroid I decided to operate. The fibroid was sessile and attached to the anterior wall of the uterus, an elliptical incision round the peritoneum of the base enabled the tumour to be shelled out of its shallow bed, the raw surface measured 10·0 by 6·25 centimetres (four by two and a half inches) and the edges were drawn together with thick plain gut. Two small fibroids, the larger one as big as a peanut, were noticed on the posterior wall of the uterus. The convalescence was sound in every way. Just under five months later she came into labour and low forceps were used to deliver her of an infant weighing 4·5 kilograms (ten pounds). She had a severe *post partum* hæmorrhage and a mildly febrile puerperium. The tumour removed measured 17·5 by 15·0 by 11·25 centimetres (7 inches by 6 inches by 4½ inches) and weighed just over 1·8 kilograms (four pounds).

When one is in charge of a patient at or near term and there is a fibroid situated in the lower portion of the uterus and sufficiently large to obstruct birth, the question of a Cæsarean section may crop up, but usually the retraction of the uterine musculature draws the obstructing fibroid up and away from the brim and a natural delivery takes place. In my experience obstruction takes place more commonly from ovarian tumours which are not drawn up out of the pelvis. I have performed Cæsarean section upon six occasions on account of ovarian tumours obstructing delivery and only twice on account of fibroid tumours and in one of these there were other indications for section besides the possible obstruction to delivery.

The history of this patient is as follows:

Mrs. W., aged thirty-six years, married, was referred to me in her first pregnancy by Dr. Parker at about the thirty-fourth week. A fibroid had been recognized by another practitioner a year previously.

The findings were: (i) The uterus was much above the normal in size; (ii) two fœtal heart sounds were heard; (iii) there was evidence of commencing toxæmia, a cloud of albumin in the urine and elevation of the blood pressure; (iv) a large fibroid was felt below the umbilicus and it could be felt *per vaginam* just above the cervix; (v) the pelvis was of the male type. The transverse diameter of the outlet measured 7·75 centimetres. The toxæmia was of a moderately severe type and the patient in consequence was kept in bed for some weeks.

The above conditions together with the age of the patient, her first and probably her only pregnancy indicated a Cæsarean section, followed by supravaginal hysterectomy. The operation was performed at term and one normal female infant and another of the same sex, but deformed, small and hydrocephalic, were removed; the deformed infant lived for twenty minutes. The abdominal wound healed well, but the patient had evidence of renal trouble for some considerable time.

The uterus is exhibited, it has been divided vertically in the midline (see Figure III). A large fibroid is seen projecting into the cavity of the uterus just above the internal *os*, it measures 11·25 by 8·75 centimetres (four and a half by three and a half inches) and is attached to the right and anterior uterine walls.

The placenta is seen with the two umbilical cords springing from it, it is implanted on the upper part of the uterus. One umbilical cord has prolapsed past the fibroid and is seen lying alongside of the internal *os*.

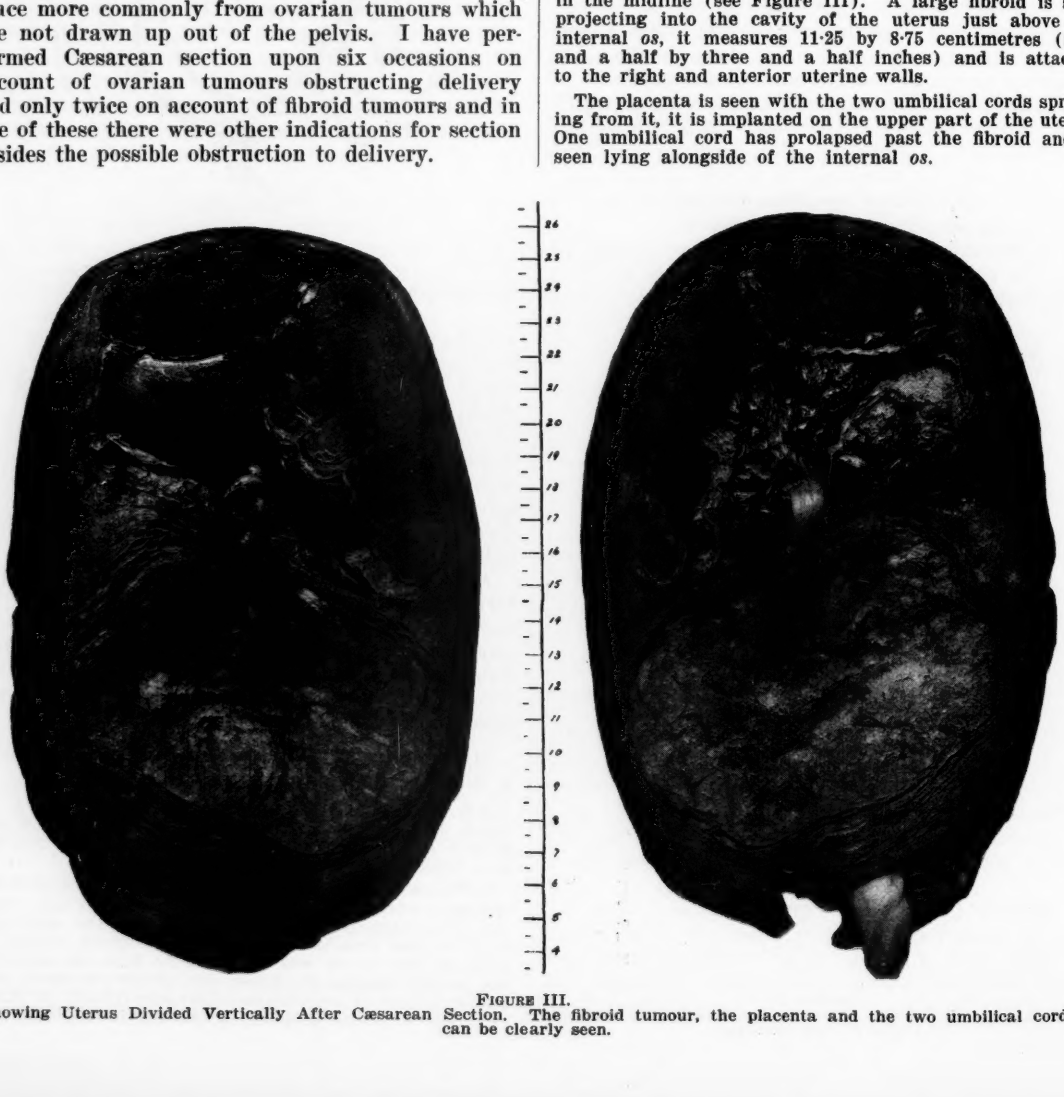

FIGURE III.
Showing Uterus Divided Vertically After Cæsarean Section. The fibroid tumour, the placenta and the two umbilical cords can be clearly seen.

Effect of Pregnancy on Fibroids.

Very frequently fibroids become softer during pregnancy and in some cases they become so soft that it is difficult to recognize them. The following history of a woman upon whom I performed Cæsarean section and myomectomy, is an example.

Mrs. B., aged forty years, was pregnant for the second time. The first pregnancy terminated two weeks after term, but the fœtus had died a week before labour set in. In this pregnancy, in spite of attempts to induce labour on several occasions by *olei ricini* and quinine, uterine contractions failed to ensue and the patient was nearly two weeks overdue, disproportion between the fœtal head and the pelvic brim of a moderate degree was present and, all things being taken into consideration, it was decided to terminate the pregnancy by Cæsarean section.

The anterior wall of the uterus which was incised during the operation, looked quite natural and there was no projection on the peritoneal surface, but the incision opened up longitudinally a soft fibroid 7·5 centimetres (three inches) long by five centimetres (two inches) thick. This tumour was so soft that it had not been detected on palpation and it cut like ordinary uterine muscle. The placenta was situated over the fibroid and free hæmorrhage occurred until the placenta was extracted. I enucleated the fibroid from the uterine wound and stitched up the wound with two layers of thick plain catgut. A normal convalescence ensued, but the patient has not conceived since.

In this case the fact that the placenta was situated over the fibroid would make the tumour more difficult to palpate.

There is no doubt that some fibroids increase in size during pregnancy, but it rarely happens that the fibroid has been seen and measured shortly before impregnation has occurred and that it has been possible to measure it again at intervals during pregnancy. I have measured as accurately as possible quite a number of fibroids first detected about the second or third month and have rarely detected an increase of more than 2·5 centimetres (one inch) in the length of the diameter of the tumour.

Red Degeneration or Necrobiosis.

Red degeneration or necrobiosis is spoken of by some writers as being a common complication in pregnancy. As far as my experience and the experience of my colleagues on the staff of the Royal Hospital for Women goes, it is practically never seen. During the last twenty years we have had over 32,000 confinements in the above hospital and we annually treat about 500 patients suffering from complications of pregnancy as well. In that number of cases only once has myomectomy been performed for a degenerative process in a fibroid occurring during pregnancy. In that case the preoperative diagnosis was an ovarian cyst with a twisted pedicle; at the operation a sessile fibroid at one cornu was removed, it was described as presenting purple and blue patchy discoloration, the pregnancy continued to term.

I have operated upon only one woman for red degeneration after a confinement or rather I should say that I have found red degeneration upon one occasion, as I removed the uterus four months after a normal confinement, hæmorrhage and slight pain had been complained of for six weeks, but had ceased two months before the operation. Three fibroid tumours were present, one 7·5 centimetres (three inches) in diameter was undergoing red degeneration, one 3·75 centimetres (one and a half inches) in diameter was of a blackish brown colour and possibly was the cause of the previous pain and hæmorrhage, whilst the other was normal in appearance.

I have seen but one other case of red degeneration and that was in consultation with an outside practitioner, a cornual fibroid about five centimetres (two inches) in diameter and two weeks after confinement. The symptoms persisted for a few days only and the patient has since remained well.

Conclusions.

Fibroids, especially those below 3·75 centimetres (one and a half inches) in diameter, are frequently found in connexion with pregnancy.

As a rule no ill results happen either during pregnancy, labour or the puerperium in a woman who conceives with fibroids in her uterus; occasionally some complication supervenes.

It is only in exceptional cases that myomectomy or hysterectomy is indicated during pregnancy.

Red degeneration is an exceptionally rare condition in New South Wales; in the majority of cases it is not a serious condition and does not need surgical treatment.

In the elderly woman, pregnant for the first and possibly the only time and with one or more fibroids in the lower part of the uterus, Cæsarean section followed by hysterectomy or myomectomy is the correct treatment, if the fibroid is large enough to give rise to difficulty during labour.

Reports of Cases.

LARGE LATERAL VENTRAL HERNIA.

By L. SWINNERTON DUKE, M.B., Ch.M. (Sydney),
Government Medical Officer, Norfolk Island.

TWENTY-SIX years ago, Mrs. B., a widow with three children, now ninety-six years of age, was sitting sewing. In trying to reach a reel of cotton on a nearby table, she overreached herself, recovered her balance, but was immediately seized by a severe pain in the right side of the upper part of the abdomen. Upon investigation she felt a small lump in the abdominal wall at the site of the pain. She was quite sure that this lump had not been present before and she thought it was a "rupture." It was partly reducible and later as the swelling increased in size she tried to control it with a self-made abdominal belt. She continued to do hard work and the mass increased steadily in size. The patient has always been well covered with subcutaneous fat.

On examination of the abdomen a large, firm, pear-shaped mass about the size of a new born baby's head is seen in the right upper quadrant of the abdomen. It is irreducible and no expansile impulse on coughing can be detected. It hangs down over the upper part of the abdomen on the right side from a short thick neck about six centimetres in diameter which penetrates the parietes outside the lateral edge of the right *rectus abdominis* at about the level of the transpyloric plane. Some dilated

veins cross the surface of the mass. There have never been any gastro-intestinal symptoms. The only inconvenience suffered by the patient is due to the size of the swelling.

The history and typical position of the swelling indicate the diagnosis of fatty hernia, probably through a blood vessel hiatus in the aponeurosis of the *transversus abdominis* at the *linea semilunaris spigelii*. Such herniæ have an interesting pathological anatomy, resemble their cousins the epigastric fatty herniæ, and occur most commonly below the level of the umbilicus. The age of the patient, size and type of the hernia constitute the interest of this case.

INSANITY AND HYSTERECTOMY.[1]

By OWEN M. MOULDEN, M.B., B.S. (Adelaide),
Honorary Gynæcologist, Parkside Mental Hospital, Adelaide.

M.M., a female, aged forty-nine years, was admitted to the hospital on January 13, 1928.

She was suffering from mental depression, with inability to concentrate her thoughts. She was very restless, resistive, hostile and impulsive. She had some delusions of a transient nature, but her memory appeared to be fairly good and orientation was not apparently disturbed. She was, however, suspicious and elusive in replying to questions. For three months prior to admission she had been in the Enfield Receiving Home, where she had been confused, slept badly and had to be forcibly fed. Her menstrual history had been normal till three months before admission to Parkside, since when there had been amenorrhœa. There was no history of pregnancy.

Her general physical examination revealed no notable abnormality except chronic mastitis of the right breast. She was referred to the gynæcological department. The *corpus uteri* was found to be enlarged backwards and several fibromyomata could be palpated in its substance.

On February 14, 1928, total hysterectomy was performed with coring out of the *cervix uteri* by Worrall's technique. Fifteen hours after operation, at 4 a.m., the special nurse in attendance was called away to give assistance with an urgent case in an adjoining ward. On her return the patient was missing and an hour later was found at her home, a distance of over a mile from the hospital. The patient stated that she had walked home and felt quite well and was in no particular pain. She was returned to hospital where she made an entirely uneventful recovery. There was no postoperative rise of temperature or of pulse rate.

From the time of her escapade, the patient showed no symptoms of insanity and four weeks after operation was discharged apparently perfectly sane.

The case is considered worthy of record as supporting two beliefs, the first, that of the ancients, of the close interrelationship in woman between the mental functions and the womb, the second, that of the modern surgeon, of the advisability of early mobilization following intraabdominal surgery!

Reviews.

PRACTICAL THERAPEUTICS.

HARE'S PRACTICAL THERAPEUTICS is a standard textbook and is too well and favourably known to require introducing to the medical reader.[2] It has deservedly attained its twentieth edition, published in 1927. The latest edition contains thirty-three more pages than the nineteenth (1925) edition, but much has been excellently rewritten and a great deal of new matter added. Nothing of proved therapeutic value is omitted and all subjects are critically considered. It is always possible to turn with confidence to a perusal of its pages. There are few textbooks of such conspicuous merit. The fourth Chinese edition is already in type.

Part I is introductory to the study of pharmacology and deals with general therapeutic considerations. Part II consists of the pharmacology, toxicology and therapeutics of individual drugs. Part III contains articles on remedial measures other than drugs. In Part IV the author discusses the therapeutics of diseases and symptoms under the name of each malady. The article on syphilis has been rewritten. It is stated that none of the substitutes for arsphenamine is as useful as the original drug, although they may possess great value for individual cases. "Tryparsamide" may perhaps be considered the best of arsenicals in the treatment of neurosyphilis. Some observers, however, consider it more prone to cause optic nerve troubles, while others deny this. "Stovarsol" is relatively a weak antisyphilitic, but it is used also with some success in amœbic dysentery and for the removal of intestinal parasites. "Novasurol"—a complex organic mercurial compound with barbituric acid—has been used in syphilis. Intramuscular injection causes considerable pain. Administered intravenously it may produce petechiæ or a widespread ulceration of the colon. Its main indication is as a diuretic in cardiac dropsy and post-operative anuria, especially if considerable doses of ammonium chloride be given with it. It effects a great elimination of sodium chloride. "Metaphen" is another complex organic mercurial preparation, used intravenously for syphilis and as an antiseptic in septicæmia. It is employed as well for gonorrhœa, coryza and sore throats. It does not stain the skin and it is claimed also that it does not damage the kidneys. Bismuth and its newer compounds in the treatment of the later stages of syphilis receive adequate consideration. "Bismarcen" is a readily soluble preparation, containing 13% of arsenic and 23% of bismuth. Its intramuscular injection is comparatively free from pain; its toxicity is low and its spirochæticidal power high. Bismuth and potassium tartrate and bismuth subsalicylate are also dealt with in this connexion and the conclusions are that bismuth is not so powerful as mercury but is more convenient to use. Tertiary lesions of the mouth and tongue and symptoms of tabes respond particularly well to the use of bismuth. Bismuth and "Arsenobenzol" have not such a strong effect on the Wassermann reaction as have "Arsenobenzol" and mercury.

Ethylene is becoming more and more used in place of the older anæsthetics for the production of surgical anæsthesia. Unlike ether, it does not produce a free secretion of mucus in the respiratory tract. It induces anæsthesia on an average in three minutes and the patient awakens promptly on its discontinuance. Respirations are quiet and resemble those of natural sleep. There is no great alteration of the pulse. Many patients vomit afterwards. Pulmonary complications are rare. The great drawbacks are the cumbersome apparatus and the liability to explosions.

Ethylhydrocuprein destroys the pneumococcus both *in vivo* and *in vitro* and theoretically should be of the greatest service in pneumococcal infections. Practically, however, it has proved very disappointing and, further, it so profoundly affects the optic nerve and retina that temporary amblyopia or permanent blindness may follow its exhibition.

Ephedrine, used as the hydrochloride or sulphate, is derived from the old Chinese vegetable drug *Ma Huang*. Pharmacologically it closely resembles adrenalin, but may act primarily as a cardiac depressant. Unlike adrenalin it is not destroyed in the stomach. It is being used largely for asthma and hay fever, but should be given only with the greatest caution in conditions of acute circulatory failure or more probably not given at all in such conditions. The symptoms of overdosage are sweating, tremor, palpitation of the heart, weakness, nausea and less often vomiting. "Isacen," which is diacetyl-dioxyphenylisatin, is a new mild and gentle synthetic laxative. It is unirritating and, not being absorbed, has no effect on the liver or kidneys. It is unchanged in the stomach, but is split up by the alkaline juices of the intestine and acts upon the colon.

[1] Read at a meeting of the South Australian Branch of the British Medical Association on March 29, 1928.

[2] "A Text-book of Practical Therapeutics," by Hobart Amory Hare, B.Sc., M.D., LL.D.; Twentieth Edition, enlarged, thoroughly revised and largely rewritten; 1927. Philadelphia: Lea and Febiger. Royal 8vo., pp. 1094, with illustrations. Price: $7.50 net.

A full account is given of the use of pollen extracts and pastes in diagnosis and prophylaxis.

The Schick test and the Dick test are fully considered as likewise are antimeasles serum and antiscarlatinal serum.

Abundant information is supplied on the employment of hypertonic (15%) saline solution to decrease intracranial pressure in brain tumour and after head injury or prior to cerebral surgery. By this method liquid is withdrawn from the cerebro-spinal system. The action is comparable to a "medicinal spinal puncture." Even twenty mils of 30% saline solution have been injected in inoperable brain tumour and conditions of deep coma with high intracranial pressure.

An excellent account is given of the treatment of bacteræmia, such as puerperal septicæmia, by intravenous injections of neutral "Acriflavine," anilin gentian violet, mercurochrome and "Metaphen." For conditions caused by Gram-positive organisms (streptococci, staphylococci and pneumococci) the last three mentioned are the best. For the rare conditions caused by Gram-negative organisms "Acriflavine" is indicated. The author considers that these injections constitute a valuable method of combating bacteriæmia. Nuclein is the most available substance for producing hyperleucocytosis and is therefore a better producer of phagocytosis.

A few words may be added concerning our own indigenous flora. The author states concerning azedarach (which is our native deciduous white cedar) that "the berries have but little toxic power and children may eat of them largely without ill effect." This is contrary to the general impression in Australia and should be definitely decided. The bark produces symptoms resembling poisoning by belladonna or spigelia. It is employed medicinally in the treatment of round worms. Amongst the toxic manifestations of eucalyptus oil no mention is made of the minutely contracted pupils which constitute the most characteristic feature. Like all other textbooks this work attributes antimalarial attributes to eucalyptus oil. The oil is not used for that purpose in Australia, but there is a magnificent field for investigation in Papua and the Mandated Territory of New Guinea. Duboisine which is used in *paralysis agitans*, epilepsy and certain forms of insanity is described as the alkaloid of *Duboisia myoporoides*. This is not correct, as it is a mixture of alkaloids. This, though a native drug, is rarely employed in Australia, but is largely administered in America and Europe. *Euphorbia pilulifera*, snake root or the Queensland asthma herb, is credited (probably far beyond its merits) with curative powers in asthma, bronchitis and emphysema. Cajuput oil and eucalyptus kino also receive mention.

GREEN'S "PATHOLOGY."

"GREEN'S MANUAL OF PATHOLOGY" has been of service to many medical practitioners in their students' days and it is pleasing to see it in its fourteenth edition, revised and enlarged by Dr. Piney and brought up to date for the needs of present day medical students and practitioners.[1] Pathology and morbid anatomy cover a wide field, embracing not merely a description, naked eye and microscopical, of the lesions and departures from normal that may be met with in the tissues of man, but also a consideration of the many ætiological causes that may give rise to these changes. Bacteriology, immunology and parasitology must be studied as they apply to the reactions in man and entail a consideration of the life histories of the living organisms concerned. Mechanical and physical agencies that injure tissues, and venins and extrinsic poisons, foreign proteins and deficiencies in vitamins or other necessary substances must all be considered in themselves and in their effects. It requires much judgement to discuss sufficiently such varied aspects covering so wide a field of knowledge and yet not to overstep the limits of a single volume of 650 pages. The present edition of Green's "Pathology" covers this ground very efficiently, the first 416 pages being devoted in this way to general pathology in a wide and liberal setting. The next 220 pages deal with the diseases of special tissues and organs and we regret that space did not permit of a little further elaboration in some cases.

The student or the practitioner desires to know, before purchasing, what ground the textbook concerned covers. As courses in bacteriology and parasitology may be carried out independently of that in pathology proper, some textbooks make but passing mention of these aspects. The pathological lesions of the female generative organs are sometimes dealt with by the gynæcologist and those of the skin by the dermatologist and so may be omitted. In this work bacteria and their allies have over forty pages devoted to them, followed by twenty-eight pages on immunity. Animal parasites, the spirochætes and certain viruses have forty-two. These aspects of pathology are well catered for. The skin has some three pages of text devoted to its lesions. With the exception of one page on the ovary, the lesions of the female generative organs, including the breast, are not considered in the second part dealing with diseases of special tissues and organs.

We feel that a student should, if possible, use two textbooks. If he uses one alone, he is apt to think that much is settled and finalized, whereas our knowledge is still too often in a state of flux. The exigencies of space require each author to be more or less dogmatic. Sometimes a "King Charles' head" makes itself seen, though we cannot see evidence of it in the work before us. By parallel reading in two such works a better idea is gained of what is sound doctrine and of what is still more or less uncertain. A better, what one might call a more stereoscopic, view of the subject is obtained by reading descriptions of the same phenomenon given by different authorities. If the one author has looked at it through red spectacles and the other through green, the fortunate student may see it in resplendent white light. In the present work some of the views submitted are stimulating and make us think, even though we may not entirely concur or may prefer for the present some other rendering.

The book is well illustrated and there are seven coloured plates, two very fine ones illustrating the appearances in *osteitis fibrosa cystica*. We note that sometimes the adjective "tubercular" and sometimes "tuberculous" is used in referring to conditions due to the tubercle bacillus. Tuberculous is the correct word to employ, tubercular meaning really possessing little tubercles or nodules and so rightly applicable in tubercular leprosy but not to an ulcer in the ileum due to the tubercle bacillus. We would like to congratulate the editor and the publishers on an excellent work and would call particular attention to its moderate price.

[1] "Green's Manual of Pathology and Morbid Anatomy," Revised and Enlarged by A. Piney, M.D., M.R.C.P.; Fourteenth Edition; 1928. London: Baillière, Tindall and Cox. Demy 8vo., pp. 658, with illustrations. Price: 21s. net.

THE HISTORY OF WOMAN.

UNDER the title "The Opposite Sexes" Dr. Adolf Heilborn has endeavoured to present to his readers a study of woman's natural and cultural history.[1] The work is translated from the German by J. E. Pryde-Hughes. There are three chapters dealing respectively with the physical structure of the female, the soul of woman and the development of the social position of woman.

The author compares man and woman continuously right through the three chapters and there is much that is illuminating and instructive to those who are interested in such questions as the equal pay for equal work or the suitability of certain occupations for both sexes.

The author stresses the idea that man is built for fight and rapidity of movement and woman for childbearing and rearing of children. A comparison is made between the pelvis of the female in the lower races of mankind and in the civilized races, the wide and roomy pelvis of the

[1] "The Opposite Sexes: A Study of Woman's Natural and Cultural History," by Dr. Adolf Heilborn, translated from the German by J. E. Pryde-Hughes; 1927. London: Methuen and Company, Limited. Post 8vo., pp. 160, with illustrations. Price: 6s. net.

latter being a cultivated product to accommodate the enlarged head of the more intellectual type of child.

Instinct with woman plays a greater rôle than with man. It is this that makes woman nearer the animal. It is instinct that makes the woman act in the subconscious spheres. The soul of woman is, according to the author, much inferior to the soul of man. The woman acts from feeling rather than from judgement and in this manner she is often unjust. So far as woman's social position is concerned it appears to have had many fluctuations from the time it is first recorded. Beginning as a chattel merely to satisfy man's desires she had no rights, only duties. Later on with the discovery of fire and the cooking pot, she became of more importance to man and therefore more valued. When the association between procreation and birth became known, woman's importance still further increased. In Egypt the status of the mother became raised to that of a higher degree than that of the father, a fact which led to the marriage of brother and sister amongst the ruling dynasty. Woman's stocks then began to fall gradually until in the eighteenth century in England a wife could be publicly sold by her husband. From those times woman has gradually entered into all man's activities and now threatens to displace him in many. Because of the author's trouble to supply information not easily accessible to everybody this book should prove of interest to all those who aim at a daily addition to their knowledge.

SIMPLE TUMOURS OF THE THYREOID.

THE interpretation of the histological pictures presented by specimens from diseased thyreoid glands presents many difficulties for the morbid histologist and this applies particularly to the non-malignant forms of thyreoid enlargement.

Robert McCarrison's book on simple goitres will therefore be welcomed by morbid histologists because of the help they will derive from the information it contains.[1] McCarrison's message, however, will interest not only the pathologist and biochemist, but also the physician and surgeon, for clinicians can ill afford nowadays to remain aloof from the scientific side of diseases the clinical side of which is their main concern. The book is presented simply and in an eminently readable form.

In his introduction to the subject the author mentions the many causes that are responsible for the present confusion in regard to simple goître and points out that for various reasons the normal histological appearances of the organ may vary from day to day or even, it may be, from hour to hour. The importance of iodine in the food and of hereditary influences are dealt with.

"Goître" is defined as a chronic non-inflammatory swelling of the thyreoid gland. It is a morbid state when it gives rise to disfigurement or symptoms or both. There is no greater fallacy than to suppose that to be normal the thyreoid must be of a certain size. Some people have larger thyreoid glands than others. Some places require the possession of a larger reserve of thyreoid tissue than others. Variability in size is most evident in the young. Such thyreoids are often styled "incipient goîtres" and because of their inclusion in goître-surveys a goître bogey seems likely to be created in some parts of the world; experience shows, however, that most of these slight swellings disappear after puberty.

An adequate supply of iodine is essential to the normal development and function of the thyreoid gland and when the gland is over-wrought, the additional provision of iodine will often aid it in its difficulties and sometimes enable it to surmount them, but iodine is not a panacea for all types of goître, nor is it proven that its insufficiency is the ultimate cause of any.

The author's report shows that there are two types of simple goître which occur epidemically or sporadically, and that there is probably a third which may occur sporadically or be intermingled with those that are endemic. The similitude of these three "goîtres" ends with the thyreoid swelling which is common to them all, as ends the similitude of the "fevers" with the pyrexia which is their most prominent symptom.

The book is divided into two parts, the first dealing with the ætiology and epidemiology of simple goître and the second devoted entirely to illustrations—one hundred and forty-three figures in all—consisting of photographs, photomicrographs and charts with their accompanying legends, all of them referring to the subject matter comprised in the first part.

The three types of simple goître that the author recognizes are: (i) Parenchymatous or chronic hypertrophic goître, (ii) diffuse colloid goître and (iii) lymphadenoid goître.

By far the greater part of the report is devoted to the first variety which the author himself has studied more thoroughly than the other two.

Parenchymatous or chronic hypertrophic goître is characterized by a true hypertrophy in which the secretory phase of the gland's activity predominates, hyperplasia is pronounced and many new vessels are formed. Overstrain ultimately leads to fibrosis, with the appearance in the organ of circumscribed areas of more or less solid glandular tissue (adenomata) or of colloid-containing vesicles (colloid adenomata) or of both. In this state of sustained hypertrophy the thyreoid is constantly straining to satisfy the needs of the tissues for its active principles, but just falling short of doing so; consequently evidences of hypothyreoidism are constantly seen in sufferers from it, hyperthyreoidism (thyrotoxicosis) rarely or never.

In the pregnant female this sequence of events may result in failure of the maternal thyreoid to satisfy the needs of the mother's own tissues and those of the developing fœtus for the gland products. As a result the fœtal thyreoid is unduly stimulated and congenital goître or cretinism may arise in the offspring.

This type of goître has its home in the high mountain ranges of the world; it is essentially a place disease. There is a definite family predisposition or hereditary tendency to the disease and consanguinity favours its development. It is associated with congenital goître, cretinism, deaf mutism and idiocy.

Two "theories" have survived from amongst the many promulgated to account for this disease; the first is the iodine deficiency theory which sees in the poverty of iodine in the water, the soil and the foods grown on that soil the essential cause of the goître; the second is the infective or toxic theory which attributes it to some unknown pathogenic organism or its products. The author believes that the truth lies in a judicious blend of both of these theories.

The second variety, diffuse colloid goître, is that type in which the vesicles of the thyreoid are of diverse shapes and sizes, distended and distorted by the accumulation of colloid material within them and in which evidence of antecedent epithelial hypertrophy and hyperplasia may or may not be present. Concerning this form of goître very little precise knowledge is available and in his description of it the author has drawn widely from the writings of other observers.

The third variety, lymphadenoid goître, is also dealt with briefly. It has been defined by Williamson and Pearse as the hypertrophic reaction of a physiologically insufficient organ with which there occurs a preponderance of lymphocytic aggregates, fibrosis and a peculiar atrophy of the parenchyma. The condition can be focal and non-goîtrous.

In conclusion the author states that in describing only three types of "simple goître" he has but touched on the fringe of the subject and that we now know that "goître" is a generic term which includes a variety of diseases of diverse ætiology. He adds that since various types of simple goître may prevail in the same locality—some capable of being benefited by the prophylactic use of iodine, some not and some that may be harmed by it—the indiscriminate use of iodine as a preventive of goître is a procedure both unscientific and dangerous.

[1] "The Simple Goitres," by Robert McCarrison, C.I.E., M.D., D.Sc., LL.D., F.R.C.P.; 1928. London: Baillière, Tindall and Cox. Crown 4to., pp. 116, with illustrations. Price: 10s. 6d. net.

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Looking into the Future.

IN 1914 there were just under 2,500 members of the Branches of the British Medical Association in Australia. In the following thirteen years this number has been increased by 54·46%, which is equivalent to an increment of approximately 4·1% *per annum*. The rate of increase is not a very rapid one. There are, however, many indications that the next quarter of a century will witness a great increase in the population of Australia and with this increase the number of medical practitioners must become proportionately greater. It is interesting to note that the membership of the British Medical Association in the year 1888 when Ernest Hart was editor of *The British Medical Journal*, was approximately the same as was the membership of the Branches in Australia when this journal was founded. At that time the average number of pages per issue of *The British Medical Journal* was twenty. This was the size of this journal in 1914. It is not suggested that the growth of the Branches in Australia will be as rapid as it was in those days in Great Britain and Ireland. Notwithstanding the uncertainty concerning the future rate of growth of the medical profession and of the Branches of the Association in the Commonwealth, it is essential to anticipate events and to make adequate provision for the future. A small community cannot carry the burden of a large one. Much that is desirable, has to be deferred until the cost becomes relatively small and until the expenditure of energy and thought needed for development is justified by the probable advantages to be gained. In 1913 the leaders of the Branches of the British Medical Association in Australia found a solution for many of the pressing needs of that time by instituting the Federal Committee. At various periods before then the proposal had been put forward that a medical association should be formed in Australia to look after the interests of the medical profession. These attempts failed on account of the strong and widespread adherence to the British Medical Association and on account of the sentiment spoken of by Sir George Syme as imperialistic. There was a demand on the part of medical practitioners in Australia to develope the scientific spirit of medicine in the Commonwealth, to maintain a high standard of medical ethics and honour and to protect the individual practitioners against exploitation and interference from without. That the Branches in Australia have gained almost complete autonomy without the severance of the tie that binds them to the parent Association, is recent history. The Branches have the power to become incorporated without any disturbance of the rights and privileges of Branches of the Association. At the last meeting of the Federal Committee a fresh proposal was put forward, not because the Branches were lacking in power to carry out their legitimate functions within the limitations of the Memorandum and Articles of Association of the British Medical Association, but because it was felt that the Federal Committee was necessarily a slow moving machine and in consequence the rate of progress and development of the Branches collectively and to some extent individually was being retarded. It was thought by the Queensland Branch that if an association were formed in Australia with a constitution similar to that of the Medical Association of South Africa (British Medical Association), the Branches might be independent of the governing influence of the Council of the British Medical Association and yet retain a close bond with this great body. There was no intention to break away from the organization founded by Charles Hastings in 1832. There was no thought of emancipation and of the setting up of wider objects. It was an expedient suggested to give the Branches a more efficient coordinating government at a lower cost. The Federal Committee as a whole did not regard the proposal favourably. It recognized that the price paid by the Branches in Australia to retain the immense advantages of being part of this Empire-wide association was small. In the first place under the existing rules it is not necessary to obtain permission or sanction

from the Council for any action that a Branch may wish to take. If all the Branches were incorporated, they could carry out all the functions provided for in the Memorandum of Association without further reference to the parent body. It is true that the actual Memorandum and Articles of Association and the By-laws would have to obtain approval, but once that has been gained, the Council is satisfied to leave everything in the hands of the corporate Branches, unless it is proposed to alter these fundamental provisions.

An alternative proposal found favour with the majority. It is that the Branches of the Association in Australia form a federal council. This body could be incorporated. The Branches could grant the federal council such executive powers as could be exercised by a body acting for six independent bodies collectively. The powers of a federal council as set out in the Articles are not clearly defined. It is doubtful whether the proposed body could initiate action and it would seem that it would have to obtain the opinion of the several Branches in matters of policy, before any action could be taken. On the other hand, it is probable that the Branches could establish a policy in regard to any particular matter and leave it to the federal council to take any action deemed advisable in any special set of circumstances and consistent with the general principle. It could become a very energetic and quickly moving body, but to achieve this end, a permanent office would have to be established and this office would have to keep in constant communication with the Councils of the Branches. Much of the work could be carried out by committees, either standing or appointed for specific purposes. The members of the committees could be drawn from all the Branches or they might be appointed with a view to economy of time and money from one city. That such a federal council would be a costly instrument to maintain at a state of efficiency is certain. The Branches will have to consider this matter and determine whether this movement would remove the last obstacle to effective work. It must be borne in mind that a strong coordinating machine, acting for the Branches collectively and competent to achieve objectives without undue loss of time, would be a substantial asset. Some of the side issues of this matter will be reserved for subsequent discussion.

Current Comment.

CÆSAREAN SECTION.

THE subject of Cæsarean section was discussed by the Section of Obstetrics and Gynæcology at the second session of the Australasian Medical Congress (British Medical Association) at Dunedin last year. The papers read by A. M. Wilson and H. Jellett were eminently practical and both authors spoke with no uncertain voice on the necessity of restricting the use of the procedure to those cases in which it alone is indicated. These authors have not been alone in their protest. The medical literature of the world during recent years has contained many similar contributions. The insane desire for the spectacular and the comparative ease with which Cæsarean section can be performed, however, still lure men from the path of moral rectitude. The use of this term is justified, for the surgeon who exposes his patient to unnecessary risk, is guilty of an unmoral act. It were kinder to ascribe his doings to ignorance. Jellett put the matter well when he said that the desire to do Cæsarean section unnecessarily was begotten of *furor operandi* out of obstetrical ignorance. But it is certain that ignorance cannot always be invoked as an excuse.

The study of hospital statistics is often a good index not only of the surgical knowledge, but also of the surgical conscience of the staff. An interesting analysis has recently been made by H. E. Miller of the results in a series of two hundred and ninety-one Cæsarean sections.[1] It appears that the New Orleans Gynecological and Obstetrical Society has made a report which covers the Cæsarean sections performed in six hospitals over a period of six years. Considered in relation to the total number of confinements in the six hospitals, the operative incidence was 1·93%. Special attention is drawn to the fact that the lowest operative incidence was experienced at the Charity Hospital (1·2%) and that at this hospital the highest percentage of abnormal labours is naturally handled. The hospital was congratulated "on permitting so many operative possibilities to escape." More than a quarter of the operations in the whole series were done by three men, one an obstetrician and two general surgeons and twenty men performed one operation each. It would be interesting to know whether these three men were attached to the staff of the Charity Hospital. This information is not given. A high percentage of abnormal maternal conditions would be expected to result in a high operative incidence. It must be concluded that the judgement at the other five hospitals was not equal

[1] *American Journal of Obstetrics and Gynecology*, December, 1927.

to that at the Charity Hospital. So it must be in Australia. If it is found that in a given area, for example one of the metropolitan cities, the operative incidence is much higher at one institution than at another, the staff at the former should be held blameworthy. No one metropolitan hospital has a monopoly of all the obstetrical abnormalities nor can all the blame be laid at the feet of juniors who might be expected to suffer more than the seniors from *"furor operandi."* It is the duty of senior surgeons and obstetricians to take care that the good name of an institution is not lost through the performance of an operation which can be avoided—in other words an operation which is unnecessary. It should not be difficult to remember that "unnecessary surgery is bad surgery."

The ages of the patients in the series described by Miller ranged from thirteen to forty-five and the stage of gestation from five months in one instance to term in 81·4%. The previous abnormal labours of the patients submitted to operation included thirty-five still-births, four craniotomy operations and fifty Cæsarean sections; in five instances this operation was performed for the second time. The number of *primiparæ* among the two hundred and ninety-one patients is not stated and the reader is left to infer that when labour had previously taken place it was abnormal. The operation was "elective," however, in 18·2% of the cases and 8·2% of the patients were allowed to have a definite test of labour. This number seems small and stress needs to be laid on the necessity for allowing the patient to have this test, but at the same time it must be remembered that vaginal manipulations should be reduced to a minimum. With proper antenatal care the need for vaginal examination will be much less. In Miller's series the number of examinations ranged from one in forty-nine instances to nine in one; seven patients had rectal examinations only and nineteen had had no examinations at all. Of the total number of patients forty-seven or 16·1% died. This is an appallingly high mortality and does not compare favourably with the figures from other places. Thus Wille in 1926 reported the results in 357 Cæsarean sections performed at the Charité Hospital, Berlin, in a series of 28,917 deliveries. The primary mortality was 1·4%. Eardley Holland and Munro Kerr collected statistics of four thousand Cæsarean sections done during the ten year period 1911 to 1920. The mortality was 1·6% for patients not in labour, 1·8% for those in the early stages of labour, 10% for those late in labour, 14% after the induction of labour and 27% after attempts at delivery by forceps and craniotomy had been made. Although this report was made on work done so many years ago, the results are probably better than those reported by Miller. Twenty-four of Miller's forty-seven patients who died, were not in labour when the operation was performed. In twenty-three labour had begun. Of these fifteen had been examined, four had ruptured membranes, one had had her vagina packed, one had been subjected to mechanical interference and two suffered from fever at the time of operation.

One point which is brought out by Miller's series and which ought not to need emphasis, is that eclampsia *per se* is not an indication for Cæsarean section. Seventeen of the patients who died, were submitted to operation on account of eclampsia. There were forty-one eclamptics in the whole series, the mortality is thus over 41·5%. The results obtained by eliminative and other treatment are so vastly superior that Cæsarean section should not be considered if eclampsia is the only abnormality present. Miller states that theoretically there might be instances when Cæsarean section might be justified when conservative measures have failed, but he has had no experience of a case of eclampsia in which it was justified at all.

There are many more points which might be raised such as the fœtal mortality, but enough has been written to show that this matter demands the earnest consideration of all who have to practise the obstetric art. The man in private practice will be guided by the actions of those in the large teaching hospitals. Hospital registrars could make matters easier by giving information in the annual reports of their institutions which will enable general practitioners to form an independent judgement not only of the value of a given procedure, but also of the conscientiousness of the staff. Obstetricians perhaps more than most people can be known by their works. General practitioners cannot do better than to reread Jellett's and Wilson's admirable papers in order to refresh their memories in regard to the indications for this operation.

ENCEPHALITIS AFTER MEASLES AND VARICELLA.

ENCEPHALITIS has been reported as a sequela to varicella on more than one occasion and pathological investigations have been carried out in both conditions. D. W. Winnicott[1] has recently reported the history of a child, aged two years and ten months who developed in a normal manner until she was one year and nine months old and who had not been well since an attack of measles and varicella at that age. The child manifested a mask-like expression, lack of balance, tremor of the head and intention tremor of the hands; there was also present a lesion of the right vocal cord which suggested a paresis of the thyreo-arytenoid muscle. Winnicott said that he did not wish to stress the association of the three diseases, but thought that it was likely that either the measles or the chicken pox had been responsible. J. D. Rolleston in discussing the case was inclined to the view that the varicella was not blameless. Winnicott said that it would be necessary to assume the presence of a nuclear lesion in the bulb in order to fit the laryngeal paresis into the clinical picture. It will be difficult to prove that encephalitis in cases of this sort is *propter hoc* and not *post hoc.*

[1] *Proceedings of the Royal Society of Medicine*, February, 1928.

Abstracts from Current Medical Literature.

SURGERY.

Surgical Drainage of the Seminal Vesicles and Prostate.

JOHN H. MORRISSEY (*Surgery, Gynecology and Obstetrics*, March, 1928) discusses recent advances in the surgical drainage of the seminal vesicles and prostate. With the development of a broader conception of possible focal infection within the urinary tract, excluding venereal conditions, the problem of treating acute and chronic infection of the prostate and seminal vesicles demands attention. Acute suppuration which does not quickly respond to palliative measures, should be treated by perineal drainage. Ischio-rectal, perirectal and superior pelvo-rectal abscess and urinary extravasation often have their origin in a perivesicular cellulitis and in the treatment of this condition the original focus is as a rule totally disregarded. It is analogous to peripelvic cellulitis, secondary to tubal suppuration in the female and is equally a source of chronic infection. Prostatectomy and vesiculotomy are most effective in the treatment of acute and chronic joint conditions and should be practised more freely. Operation usually gives immediate relief from pain, prevents gross joint changes and induces hastened resolution of the inflammatory areas. Drainage should be maintained for at least ten days and is of the utmost importance. Operation does not prevent recurrence of pain in the rheumatic subject and sterility and functional disturbances should be considered. Sterility is probably coincident with the operation and is not caused by it. Periprostatic infection with infiltration of the ejaculatory ducts is largely contributory to the vesicular infection and free, adequate drainage must be provided by liberal prostatic incisions. In patients who have suffered from remote or recent venereal disease, operation may be performed without undue risk and the mortality is nil.

Causes of Death in Acute Intestinal Obstruction.

W. D. GATCH, H. M. TRUSLER AND K. D. AYRES (*Surgery, Gynecology and Obstetrics*, March, 1928) have investigated the causes of death in acute intestinal obstruction. Acute mechanical obstruction of the intestine is of two types: acute simple obstruction in which there is simple occlusion of the lumen without bowel necrosis, and acute strangulation in which the obstruction is complicated by the presence of gangrene of the bowel. Simple obstruction occurs chiefly high in the tract at the pylorus or the duodenum. In this condition death is not due to the absorption of toxins, but is caused by a profound metabolic disturbance resulting from three factors: dehydration, loss of chlorides and starvation. In simple obstruction occurring low in the bowel the metabolic functions are not definitely disturbed and none of these changes are pronounced. In acute strangulation these factors are present, but are overshadowed by toxæmia. The toxin is the product of proteolysis due to the action of putrefactive bacteria in the obstructed bowel. When absorbed it exerts an action similar to that of histamine. It is not absorbed from the intact intestinal mucosa, but makes its way into the circulation through an overdistended bowel and in the event of gangrene the absorption by way of the peritoneal surface is rapidly fatal. In the small intestine practically all the obstructions met clinically or produced experimentally are sooner or later complicated by gangrene. In the light of present knowledge the prognosis of acute simple obstruction should be favourable, unless the patient is moribund before treatment is instituted. The metabolic disturbances resulting from dehydration and loss of chlorides are effectively relieved by the parenteral administration of sodium chloride solution. In obstruction due to or complicated by gangrene this treatment is of value in that it supplies fluids and chlorides, increases kidney elimination and supports the general circulation. The toxæmia, however, is not relieved by such measures. It is obvious that once a sufficient dose of toxin is absorbed, death is inevitable. This process must be arrested early. The general principles of surgical treatment are outlined with this purpose in view.

Diverticulitis.

W. ZWEIG (*Wiener Medizinische Wochenschrift*, October 1, 1927) discusses the diagnosis and treatment of diverticulitis. The acute type is associated with left-sided pain, tenderness and vomiting. Abscess formation and perforation may occur. Occasionally a circumscribed abscess forms in the pouch of Douglas. The more chronic type is marked by constipation, dyspepsia, loss of appetite and flatulence. Malignant changes may be noted. Mayo reported thirteen cases in which malignant changes took place, in a series of forty-two. The tumour tends to grow more externally than towards the lumen of the bowel and there is no tendency to stenosis. Urinary symptoms—pyelitis and hydronephrosis—due to pressure on the ureter are often observed. In radiograms there is a loss of clear outline of the bowel. In some cases after two or three days the barium enema is seen in the cavity of the diverticulum. With the sigmoidoscope a small opening exuding pus like lava may be observed. The mucosa surrounding the opening is engorged and frequently ulcerated. Acute diverticulitis requires opening of the abscess and free drainage. Chronic diverticulitis is best treated conservatively, otherwise a dangerously wide resection of the colon may be required. Saline aperients should be administered instead of enemata because of the risk of perforation. The diet must be regulated to avoid constipation. Hot applications will assist resorption of the inflammatory mass.

Tumours of the Testis.

AUBOURG AND MARCEL JOLY (*Bulletins et Mémoires de la Société des Chirurgiens de Paris, Tome* XIX, *Numero* 14, 1927) review the action of X rays on testicular tumours. In those cases in which the testicle alone is involved, the testicle should be removed and irradiation of the lumbo-aortic lymphatic area carried out. Where both are involved, the same procedure is necessary, but the authors describe a special technique for each type of tumour and for inoperable recurrence. They give histories *et cetera* illustrating each type of tumour.

Preoperative Deep X Ray Therapy in Cancer of the Breast.

CHARLES BUIZARD (*Bulletins et Mémoires de la Société des Chirurgiens de Paris, Tome* XIX, *Numero* 12, 1927) gives an account of a long discussion which followed a former communication on preoperative irradiation of the breast in cancer. All speakers were agreed on the serious prognosis in breast cancer. In atrophic scirrhus in old women irradiation should be done, followed later either by merely symptomatic treatment or secondary removal of the tumour. In all other operable tumours immediate operation should be performed without any previous irradiation. Immediate operation offers the best chance of recovery. In inoperable tumours irradiation may cause some relief from pain, in less advanced cases a cessation of growth of the tumour or even its disappearance may be hoped for and in some cases radiation so alters the growth as to render it operable. The question whether deep X ray therapy, radium or a combination of these should be employed must be considered in each instance. Deep X ray therapy and the use of radium do not exclude each other and may be often combined with advantage. Whichever method is employed, it is important that a very large area should be irradiated, for when the area treated is too limited, excitation of the surrounding areas may take place by diffusion and determine a rapid proliferation and a generalized dissemination of the growth.

Surgical Aspects of Chest Injuries.

CHARLES D. LOCKWOOD (*California and Western Medicine*, February, 1928) divides chest injuries into those of the chest wall, of the pleura and of the lungs. In simple fracture of the ribs simple strapping with adhesive plaster is sufficient, but in multiple rib fractures there is grave danger of shock, of hæmothorax, of pneumothorax and of massive collapse; these conditions are best treated by means of a split, light plaster of Paris

cast. "Stove-in" chest is an extremely serious injury and calls for skilful surgery. The most distressing type of chest injury is the sucking wound. Startling improvement follows air-tight closure of the wound either by skin suture or by plugging with moist gauze. Injuries to the pleura result from the penetration of a foreign body; the complicating pleural exudate is the most serious feature of such injuries. Frequent aspirations guided by X rays and physical signs or rib resection and drainage may be required. When the pleural cavity has been widely opened at the time of the injury, it should be cleaned and tightly sutured; the complicating exudate can best be handled through some intact part of the chest wall. Diaphragmatic wounds should be closed by intrathoracic suture. The most common injury to the lung is due to gunshot wounds. Rifle bullets as a rule cause little damage beyond hæmothorax followed by empyema and expectant treatment should be adopted, frequent aspirations often resulting in a cure. If pus forms early, rib resection and drainage are indicated. Soft nosed bullets and fragments of shell cause extensive damage and are often rapidly fatal. In such circumstances prompt and bold surgery is required. The chest should be widely opened along the fourth rib by Tuffier's method and the bleeding thoroughly dealt with. In extensive laceration lobectomy may be required; hæmorrhage is easily controlled by mattrass suture. In severe lung injury with hæmorrhage active surgical treatment will save many lives, inaction will usually result in death. Encapsuled foreign bodies should not be disturbed. Massive collapse of the lung is discussed. The author holds that it should be diagnosed on the characteristic symptoms and on the X ray and physical findings. This condition which may give rise to alarming symptoms and which often leads to errors in diagnosis, is rarely fatal, it requires little treatment and spontaneous adjustment usually takes place in from twenty-four to forty-eight hours.

Evulsion of the Phrenic Nerve in the Treatment of Pulmonary Tuberculosis and Bronchiectasis.

H. MORRISTON DAVIES (*Tubercle*, February, 1928) attempts to assess the value of hemi-diaphragmatic paralysis, by evulsion of the phrenic nerves in the treatment of pulmonary tuberculosis and bronchiectasis. He reviews his experiences in one hundred and five cases. After discussing the history of the operation, he summarizes the various abnormalities of the nerve which he has encountered, and gives details of the various effects he has noted both at and after operation. Of the one hundred and five operations, nine were performed for the purpose of arresting the disease in patients with basal tuberculosis or bronchiectasis, twenty-five to assist in controlling the disease in those with extensive, chronic or more advanced or more acute forms of pulmonary tuberculosis, twenty-five were done as an accessory to artificial pneumothorax, five for the treatment of symptoms occurring in the course of the disease, thirty as a preliminary to thoracoplasty, three as a preliminary to the radical treatment of a tuberculous empyema in order to reduce the size of the pleural cavity, two as a prophylactic against the development of bronchiectasis after an unresolved pneumonia or in the presence of long-standing basal effusions with fibrosis of the lower lobe. Six were performed in order to free the heart from the embarrassment caused by the excessive displacement produced by the drag on it from a fibrosed lung, especially when there was thickening of the pleura and when pleuro-pericardial adhesions were present or to abolish symptoms, chiefly pain and dyspnœa, resulting from a scarred lung and thickened pleura. Each of these groups is discussed in detail. The author comes to the conclusions that in true basal tuberculosis the operation has been without doubt largely instrumental in arresting the disease; it is, however, of little use in basal bronchiectasis. When the disease is generalized, but mainly unilateral, improvement of varying degree may be expected in about 50% of cases; this also applies in bronchiectasis. Considerable benefit may be anticipated in a large percentage of patients for whom the operation is performed as an accessory to incomplete artificial pneumothorax, particularly when the base of the lung is adherent to the diaphragm. Phrenic evulsion should always be performed before a lung, long collapsed, is allowed to reexpand. The operation will frequently produce complete relief of distressing symptoms due to irritation of the muscle or adhesions. The operation should, moreover, always be performed as a preliminary to thoracoplasty and should also be done whenever resolution is still incomplete three to six months after the onset of a basal pneumonia as a prophylactic against the development of bronchiectasis.

End Results in Sarcoma of Long Bones.

WILLIAM B. COLEY (*American Journal of Surgery*, February, 1928) in a clinical lecture on the end results of sarcoma of long bones gives the histories of twenty patients whom he showed. Seven patients suffering from the osteogenic type of sarcoma had been well for from three to twenty years. Five suffering from the endothelioma type had been well for from three to seventeen years. Six suffering from the giant or giant and spindle cell type had been well for from four to twenty-three years. Twelve suffered from periosteal osteogenic sarcoma; eight of them had been well for from five to twenty years and in two metatases had occurred. The author, although one of the earliest advocates of conservative treatment, now believes that it has certain limitations depending on the type of the tumour as determined by histological and clinical examination. Amputation alone is able to cure but a small number of patients with periosteal osteogenic sarcoma, but early amputation followed by prolonged treatment with mixed toxins (Coley's fluid) has resulted in an apparent cure in 50%. In regard to radiation, for ten years the staff of the Memorial Hospital has treated nearly all patients with bone sarcomata by radium alone and has definitely proved that giant celled sarcoma of long bones can be cured by this means. The author, however, does not believe that it is the best method and he still continues to treat patients with bone sarcomata in the old way, that is by curettage, followed by injection of toxins alone or combined with irradiation for sarcomata of the giant celled group. He uses early amputation followed by injection of toxins for the osteogenic group. For rapidly-growing, round-celled sarcomata of the shaft (Ewing's sarcoma) he employs a thorough course of systematic injections of mixed toxins combined with local radiation and he reserves amputation only for those patients who do not improve under this treatment. In giant celled sarcomata, the following routine is carried out: thorough curettage down to hard bone is performed, the cavity is washed out with carbolic acid or zinc chloride solution and is packed with sterile gauze, the cavity is kept clean with Dakin's solution and a three to four months' treatment with mixed toxins is given. In advanced cases a single radium pack treatment is given, when the cavity has nearly filled with granulations. Irradiation appears to be associated with a definite risk of metastasis or of the tumour becoming inoperable in osteogenic sarcoma and preliminary irradiation before amputation is not advocated in these conditions.

The Glucose Enema in Post-operative Treatment.

DAVID LEVI (*The British Journal of Surgery*, October, 1927) gives an account of his research to demonstrate whether glucose is absorbed from the rectum in sufficient quantities to make the glucose enema of clinical value and to determine the place of the glucose enema in post-operative shock. After describing the technique followed and the results of his observations on fasting normal men, fasting diabetics and fasting persons after operation, he concludes that the power of absorption from the rectum, although subject to individual variation, is slow. Very little sugar is absorbed by this route. The glucose enema in his opinion is of little value as a means of maintaining bodily nutrition. He also believes that individuals who are the subject of post-operative shock, are in a state of hyperglycæmia and are unable to utilize sugar in a normal manner. A glucose rectal saline solution enema given under such circumstances is not only useless, but also actively harmful, as it would appear that the absorp-

tion of fluid from the bowel is actively hindered by the presence of glucose. The author concludes that the obvious sequence of his investigations would be the administration of "Insulin" in these circumstances; further research is being carried out on this aspect of the question.

Preliminary Medication in General Anæsthesia.

J. T. GWATHMEY AND C. W. HOOPER (*American Journal of Surgery*, December, 1927) discuss the question of preliminary medication in general anæsthesia. They suggest that for adults, morphine eight milligrammes (one-eighth of a grain) in two cubic centimetres of a 50% solution of magnesium sulphate should be used one hour before operation and that this should be repeated at intervals of fifteen minutes, twice for males and once for females. In addition 0·6 gramme (ten grains) of chloretone should be given either by the mouth or as a suppository. If unconsciousness is desired, the following retention enema is given forty minutes before operation: paraldehyde eight cubic centimetres (two fluid drachms), ether seventy-five cubic centimetres (two and a half fluid ounces) made up to 120 cubic centimetres (four ounces) with oil. This will not cause surgical anæsthesia, but the amount of anæsthetic required will be considerably reduced. Experiments carried out on five hundred animals to determine this question showed that, regardless of the anæsthetic used, lung lesions occurred when the animals were not given preliminary medication. The authors conclude that the removal of psychic impulses, the reduction in the amount of the terminal anæsthetic, the increased margin of safety and the prevention of lung lesions are sufficient reasons for the adoption of preliminary medication with all methods of inducing analgesia and anæsthesia.

Duodeno-Jejunostomy.

G. E. AROSTEGUI (*Vida Nueva*, July 15, 1927) states that the first duodeno-jejunostomy was performed on a cadaver in 1900. The operation has become increasingly popular during recent years as a means of relieving disorders of the gastro-intestinal tract which result from perivisceritis due in its turn to inflammatory lesions in the gall bladder, appendix or other abdominal organs or to previous operations. Earlier diagnosis and better results from operative treatment are possible through the close collaboration of the clinician, the surgeon and the radiologist. He describes two cases. The first was that of a young woman of twenty-three, sent to him with a diagnosis of duodenal compression and adhesive periduodenitis. She had suffered for seven years from vomiting and other gastro-intestinal disturbances. Medical treatment was of no avail. Radiological examination revealed a hypotonic stomach and dilated duodenum. Laparotomy revealed intense perivisceritis in the right upper quadrant of the abdomen, with many adhesions. The gall bladder and the inflamed appendix were removed, adhesions were freed and a submeso-colic duodeno-jejunostomy was performed. The patient got up on the fifteenth day and suffered no more inconvenience. Radiological examination revealed that the duodeno-jejunal passage functioned well. The second case was that of a woman thirty-four years of age. She had had an appendicectomy performed thirteen years previously. Five years later she submitted to a subtotal hysterectomy and left salpingo-oophorectomy. After this she enjoyed good health for five years. She then had a great deal of disturbance in her gastro-intestinal tract which culminated in an acute attack of pain in the right upper quadrant of the abdomen, accompanied by jaundice, fever *et cetera*. Medical treatment was unsuccessful. She was operated upon again and adhesions were freed. Later radiological examinations revealed a hypotonic stomach and dilatation of the duodenum. Extirpation of the gall bladder, freeing of adhesions and duodeno-jejunostomy resulted in complete clinical cure and radiological examination proved that the operation was successful from a functional point of view.

The Injection Treatment of Internal Hæmorrhoids.

IN 1916 Arthur S. Morley described a method of treating internal hæmorrhoids by the injection of a 20% solution of phenol in equal parts of glycerine and water into the centre of the hæmorrhoids. He has now reported (*The Lancet*, March 17, 1928) that although satisfactory results on the whole have been obtained in the treatment of 5,000 patients by this method, certain complications occurred in approximately 0·5% of cases. These complications included sloughing attended by intense pain and hæmorrhage which at times was severe. Since 1926 he has adopted the technique advocated by Blanchard, of Youngstown, Ohio, United States of America, and he finds that the complications have been eliminated. In this method he uses a 5% solution of phenol in vegetable oil, such as almond oil and injects the solution under the mucous membrane instead of into the pile mass. The quantity injected under each pile is usually from one to two cubic centimetres. Blanchard's "striation sign" is used as a guide to the amount of fluid which should be injected. According to this sign when enough of the oil has been injected the pile becomes swollen and whitened and the injection must be stopped when the superficial vessels can be seen as very fine red threads running over the surface of the whitened hæmorrhoid. Only by experience and judgement can the correct degree of distension of the hæmorrhoid be determined. Every hæmorrhoid is dealt with at each sitting. If the injection is properly made, no bleeding follows the withdrawal of the needle. If the surgeon encroaches upon the muco-cutaneous junction, pain invariably follows. The injections should be continued at intervals of from five to seven days, until each pile is of parchment-like hardness from its upper extremity to the muco-cutaneous junction. About five injections as a rule are sufficient. Although symptoms of carbolic acid poisoning might reasonably be expected to occur, the author has not seen any, nor has he had experience of carboluria or other sign of carbolic acid poisoning in any of his patients. He concludes with the statement that the method is one which requires special instruments and special skill and experience. He does not think that it should be attempted by those who have only few opportunities for its employment. He recommends it strongly, however, to surgeons who are accustomed to using the older methods of injection.

Complications of Fractures of the Long Bones.

C. H. FAGGE (*The Lancet*, January 21, 1928) classifies the disabilities which may follow a simple fracture of a long bone, into several groups. The first group comprises those affecting the bone itself, which result from failure to restore alignment or to maintain alignment when once it has been restored. He considers that these are preventible in the great majority of cases. The second group of disabilities includes those involving the muscles. The causes of these are the same as those in the first group and they are equally preventible. Ossification of muscles is a very rare complication and in the author's experience is directly attributable to rough handling and early passive movements. The third group includes those disabilities which affect adjacent joints. Some of these are mechanical. For example, the bone surface is involved by the misplaced fragment or by callus. The author holds that these are preventible. Chronic traumatic arthritis, in his opinion, will occur only when the mechanics of the part are altered by a fracture and this happens when alignment is imperfect. It is, in part at least, due to faulty alignment. At the same time interference with the nutrition of the joint surfaces may be a factor. The fourth group comprises disabilities due to nerve involvement. The author insists that these, in addition to being relatively rare, are not due to the involvement of the nerve by callus, but are due to interstitial bruising due to actual injury at the time of the accident; in the majority of instances recovery occurs. In doubtful cases it is necessary for the surgeon to inspect the condition of the nerve in order to determine actually what damage has been done. The chief cause of displacement between the fragments is the force which produces the fracture. After the fracture has occurred, the natural tone of all muscles around the bone undoubtedly causes overlapping. The displacement in a given fracture conforms exactly to the direction of the force. Soft parts between the ends of the bone are second only to sepsis as a local cause for non-

union. The Fracture Committee of the British Medical Association in 1912 adopted the conclusion of the sub-committee that "a good functional result depends exactly upon a good anatomical result" and the author admits the truth of this statement after fifteen years' test of its value. He lays stress on the value of inspection and reduction of fractures under an anæsthetic on the X ray table and he considers that if this were done more frequently, the surgeon would discover that plates or films taken as a routine, do not always disclose the true deformity or maximum displacement. In the event of failure at a second attempt to reduce the deformity on the X ray table, early open reduction should be undertaken. Reduction of a recent ununited fracture is as a rule easy during the first few weeks and perfect anatomical reduction can be almost guaranteed if the reduction is done within this period. The indication for operative treatment is the failure to obtain or maintain restoration of alignment by manipulation. It is frequently unnecessary to utilize any artificial fixation beyond simple open reduction. The removal of detached fragments is generally a confession of failure. An open wound is no contraindication to simple open reduction. The absorbable internal splints in the form of homogeneous or heterogeneous bone grafts provide no advantages over internal unabsorbable splints. The author strongly advocates the use of plates and screws in most long bone fractures. If restoration of shape and complete immobilization are desired he rarely finds it necessary to remove plates except in open fractures. He emphasizes the value of plates in some comminuted multiple fractures in close proximity to joints where intramedullary pegs are useless. Where there is lack of union after six weeks, his practice is to immobilize the limb completely for another six weeks in plaster, wherever possible he makes the patient walk on crutches and he utilizes Bier's hyperæmic treatment. If after this period there is no union, operation is indicated.

Appendicitis with Some Unusual Manifestations.

L. W. JOHNSON (*The Military Surgeon*, April, 1928) reports a case of appendicitis in which some unusual features were noted. The patient was a man aged twenty-four years. Shortly after an attack of vomiting with abdominal pain and diarrhœa the patient had a severe rigor and his temperature rose to 41·3° C. (106·4° F.). After the rigor a generalized erythematous rash made its appearance. The patient complained of severe headache and the abdominal pain subsided. His face became congested and purple. The leucocyte count was 6,500 cells per cubic millimetre. At operation the visceral peritoneum was found to be dry and granular, dark red and covered with petechial spots. The appendix was black, contained a stercolith and was in part distended by fluid. The patient recovered after removal of the appendix and drainage of the peritoneal cavity.

Torsion of the Great Omentum.

CHARLES MACAULEY (*The British Journal of Surgery*, January, 1928) reports two cases of torsion of the omentum. The first occurred in a male patient, aged twenty-five years, whose illness began suddenly with pain in the right iliac region which was not very severe. He took castor oil and although his bowels moved the pain was not relieved. He vomited once. He was a small, slim man. His temperature was 37·8° C. (100° F.), his pulse rate 86 and his respiratory rate 20 in the minute. His tongue was furred and the abdominal movements were restricted. A diagnosis of acute appendicitis was made. At operation some blood-stained fluid escaped when the peritoneal cavity was opened by the right pararectal incision. Portion of the right margin of the omentum was found to be purple and strangulated from a twist at its base. The affected part of the omentum was removed. The second patient was a very stout man, aged forty-eight years. He experienced a dull pain in the region of the umbilicus; he took sulphate of magnesium and the bowels moved two days after the onset of the pain, but the pain was unrelieved. The patient did not vomit. His temperature was 37·2° C. (99° F.), his pulse rate 100 and his respiratory rate 24 in the minute. His tongue was furred and his abdominal movements restricted. An indefinite but very tender mass was felt in the right iliac fossa and there was also an old standing inguinal hernia. A diagnosis of acute appendicitis with possible appendiceal abscess was made. The abdomen was opened by a transverse incision on the right side below the umbilicus, œdema of the parietal peritoneum was found. Blood-stained fluid escaped when the peritoneal cavity was opened and a purplish mass immediately presented itself. The mass was adherent to the abdominal wall. It was freed with ease and removed. The author points out that the difference in size of the two masses corresponded with the build of the patients. The presence of early œdema especially when followed by the exit of blood-stained peritoneal exudate should make the surgeon remember the possibility of the presence of omental torsion. It is conceivable that the condition might be overlooked when the abdomen is opened by the grid iron incision, especially if the affected portion of omentum is quite small and if operation is performed early in the attack.

Cancer of the Rectum.

CHARLES GORDON-WATSON (*Proceedings of the Royal Society of Medicine*, December, 1927) in an address before the Royal Society of Medicine has discussed the treatment of cancer of the rectum with radium by open operation. He describes his remarks as a preliminary communication and in recording the results of the treatment of fifteen patients he states that he is anxious not to raise false hopes or to give false impressions, but that he wishes to stimulate others to test the value of the method which he describes. The method is that adopted by Neumann at the Radium Institute of Brussels. A preliminary colostomy is made and at the same time the condition of the liver is investigated and a portion of the growth is removed for the purposes of microscopical examination. From ten to fifteen days later the growth is exposed as freely as possible from behind and the anus is sutured. The lines of lymphatic spread along the three sets of hæmorrhoidal vessels are first attacked and then the growth itself is "barraged" by the insertion of radium needles of equal strength at equal distance and parallel to one another over the whole area up to the free margin. Penetration of the mucosa should if possible be avoided when the needles are being inserted and great care is required in advanced growths to avoid tearing open malignant tissue or rupturing the bowel and so exciting sepsis which desensitizes the tissues to radio-activity. When the "barrage" is complete, the needles are counted, the strings united and the total radium calculated. The exposed area is packed with gauze and catheters are inserted into the wound to allow of subsequent Carrel-Dakin treatment. The wound is closed around the cavities and is infiltrated every day with "Flavine" to diminish sepsis. The needles are left in for periods which vary according to the size of the growth, the amount of radium employed and the fitness of the patient, for from seven to fourteen days. The largest amount of radium employed by the author has been 53·5 milligrammes. The maximum milligramme-hour dose has been 9,840 and the minimum 2,268. Of the fifteen patients treated by the author two suffered from tumours which were operable and thirteen from tumours which were "hopelessly inoperable." Of those with inoperable tumours one improved so much after radium treatment that successful excision was carried out at a later date. Of the remaining twelve with inoperable tumours four died after treatment; the intervening periods between treatment and death in these four instances were fifteen and a half months, ten months, nine months and one month. The remaining eight all derived benefit in varying degrees with diminution in the size of the growth. In two no growth could be detected. Of the two patients with operable growths one suffered from a squamous celled carcinoma; this was destroyed by radium, but recurred after fifteen months and the patient succumbed to excision. The growth of the other was an early one without ulceration. No incision was made into this growth for fear of dissemination and as a result of the radium treatment the patient is apparently cured.

Special Abstract.

THE USE OF ORGANIC ARSENICAL COMPOUNDS IN STREPTOCOCCAL INFECTIONS.

SINCE the introduction by Ehrlich of "Salvarsan" in the treatment of syphilis various attempts have been made to use arsenical compounds as destructive agents of bacteria *in vivo*. Work along these lines was interrupted by the war, but Dr. Leonard Colebrook and Captain S. R. Douglas sought to test the possibility of applying arsenical compounds to the virulent forms of septicæmia occasioned by war wounds. Although no definite conclusion was reached, it was found that arsenical compounds differ from almost every other known "antiseptic" substance in that their administration to man results in the patient's serum acquiring a power which it did not previously possess, of killing certain bacteria.

The inquiry has been taken up during the last few years by Colebrook and the Medical Research Council has published the result of his researches in a special report.[1] He has divided his report into three parts and each part deals with a different aspect of his experimental work.

The Bactericidal Potency Conferred Upon the Serum in Vivo.

As far as Colebrook is aware ethyl hydrocuprein or "Optochin," "Neosalvarsan" and "Salvarsan" with several of its derivatives are the only substances known by the injection of which bactericidal power can be conferred upon the serum *in vivo*. All other chemical agents so far experimented with appear to become fixed almost as soon as they enter the blood stream either upon the serum proteins, the cells of the blood or one or other of the fixed tissues.

Details of experiments are given illustrating the bactericidal effect which can be obtained with the serum of patients under treatment by "Novarsenobenzene" or "Salvarsan." In these experiments graduated capillary pipettes were used and hæmolytic streptococci were employed, because there was reason to believe that the arsenical compounds have a greater destructive affinity for these organisms than for staphylococci or other types of streptococci. Samples of blood were taken from patients before and at intervals after the injection of the drug. Each sample of serum was implanted with one-twentieth of its volume of a suitably diluted broth culture of hæmolytic streptococci and then transferred to the incubator for a number of hours. A measured volume was removed at intervals and explanted into melted blood agar in a Petri dish. The number of colonies which were grown after incubation was estimated. The results are set out in tabular form. It was found that hæmolytic streptococci were able to multiply freely in the serum taken before the injection. This is almost invariably the case; the fresh serum of normal individuals and even of patients infected with hæmolytic streptococci has no demonstrable bactericidal action on these organisms. The serum of patients taken at intervals after the dose was bactericidal in greater or less degree to hæmolytic streptococci. This bactericidal power was greatest in the serum taken immediately after the injections and fell away more or less progressively during the next twenty-four hours. Traces of it were occasionally detected up to three or four days after a single dose. The bactericidal action of the serum was characterized by a prolonged lag, roughly speaking a period of three to five hours. During this lag period the cocci often multiply in serum which afterwards kills them. In one instance twenty-five cubic centimetres of serum taken one hour after the dose of the drug had been given, completely killed 2,400 streptococci, equivalent to 96,000 per cubic centimetre, while the serum taken twenty hours after the administration of the dose completely destroyed the organisms at the rate of 400,000 per cubic centimetre.

[1] "A Study of Some Organic Arsenical Compounds with a View to Their Use in Certain Streptococcal Infections," by Leonard Colebrook, M.B., B.S. Special Report Series, Number 119, Medical Research Council of the Privy Council, 1928.

Another procedure was adopted in order to gain further information in regard to the actual number of streptococci killed by the serum of patients after they had been treated by arsenical drugs. A graduated series of dilution of the streptococcus culture was first prepared and five cubic millimetres of each dilution were mixed with a twenty-five millimetre sample of the serum to be tested. The several samples of serum thus implanted were incubated in the stems of capillary pipettes until the following day and then blown out into a sufficient bulk of fluid nutrient medium. It was found that doses of 0·3 gramme and upwards of "Novarsenobenzene" never failed to confer bactericidal power lasting some hours upon the serum of patients to whom they were administered. When the average of the findings from seven patients is taken, it is seen that the bactericidal action of the serum taken one to two hours after the dose was represented by the fact that 370,000 streptococci were killed per cubic centimetre of fluid. The bactericidal power was usually nil or of small degree twenty-four hours after the dose. It was thought that the bactericidal power could have been kept up for a longer time by repeating the dose at intervals of twelve hours, but in view of the known toxicity of the drug this was not attempted. By intramuscular injections of "Sulfarsenol" and "Kharsulphan" (which are known to be less toxic), repeated at short intervals, the bactericidal power of the serum was kept up for two to four days. By injections of "Metarsenobillon" repeated at longer intervals it was found possible in one instance to maintain this acquired bactericidal power for as long as one month.

Further experiments of a somewhat similar nature were carried out with various microorganisms and it was shown that the several species used in the test were by no means equally susceptible to the bactericidal action of these drugs. The hæmolytic streptococci and pneumococci were most readily killed, next to these came streptococci of the *viridans* group and the staphylococci, while the enterococcal types proved very resistant, at any rate to weak solutions such as might come into operation in the human body.

Arsenical Compounds and Their Effects Upon the Normal Protective Elements of Human Blood.

Colebrook points out that the work of Fleming in 1924 strongly emphasized the damage done to the normal protective elements of the blood, particularly the leucocytes, by the contact *in vitro* with "antiseptic" drugs of all kinds. It was therefore determined to examine carefully the influence of arsenical compounds on these cells. In view of Fleming's results it is quite possible that the presumptive advantage secured in the serum by means of these compounds might be counterbalanced or more than counterbalanced by an injurious effect on the patient's leucocytes. Two sets of investigations were therefore made. One set was carried out *in vitro* in order to ascertain whether there was any probability that administration of medicinal doses of these compounds would involve any injury to the patient's normal protective mechanism and the other set comprised some determinations of the functional capacity of the patients' leucocytes before and after the injection of these drugs in order to ascertain whether such injury had actually been inflicted.

In Vitro Experiments.

The arsenical compound under investigation was added in progressive quantities to human blood and investigations were made into the effect of such addition upon (i) the phagocytic capacity of the blood, (ii) the appearance of its leucocytes and (iii) the bactericidal potency of the blood.

Progressive dilutions of the arsenical solution were first made and one part of each of these was added to nine parts of defibrinated human blood. The control blood was mixed with one part of physiological salt solution. After five hours' contact with the drug at 37° C. and again after twenty-four hours phagocytic tests were carried out with the specimens of blood. The phagocytic counts obtained from one series of films showed the effects of the arsenical drugs upon the opsonic power of the serum. In films of a second series was manifest the effect upon

the leucocytes. Thus blood samples containing from one part in 100,000 to one part in 15,000 of each drug tested yielded specimens of serum whose opsonic power was within 5% or 10% of that of the control serum, except in one or two instances in which higher values were obtained with serum containing very small amounts of the arsenical drug. These higher values were sometimes as much as 30% above the normal.

An unforeseen difficulty was encountered in studying the effects of the drugs upon the leucocytes. Many of the leucocytes which had been in contact with the stronger solutions of the drug, appeared in the stained films as mere ghosts, devoid of recognizable neuclei. In others the nuclei were just recognizable, but swollen and very ragged in appearance and the protoplasm was full of fine granules. No cocci which had undergone phagocytosis could be seen in the cells. The polynuclear cells had suffered the most damage, but the mononuclear cells and the large lymphocytes were also changed in smaller degrees. The small lymphocytes appeared normal. Among the polynuclear cells, however, the changes were by no means uniform; in most of the films there was present a percentage of well formed cells which exhibited almost normal phagocytosis. It thus proved advisable to abandon the usual plan of computing the number of cocci ingested per leucocyte and to take account simply of the proportion of cells which contained any microorganisms. The results of this investigation are shown in tabular form. It was found that all the compounds tested had strongly toxic effects on human leucocytes if kept in contact with them at 37° C. for twenty-four hours in a strength of one in 40,000 and upwards. In the case of "Novasenobenzene" and "Kharsulphan" it was found that this toxic action is a slowly progressive one. Of all the compounds tested "Silver Salvarsan" was the most injurious to leucocytes, "Salvarsan" and "Novarsenobenzene" came next and were approximately equal, while "Sulfarsenol," "Kharsulphan" and "Metarsenobillon" proved to be the least toxic of the two. It will be pointed out later on that the leucocytes of heavily infected patients were found to be considerably more sensitive to the toxic actions of these arsenical drugs than those of normal blood to which the results just mentioned refer.

The bactericidal effect of normal blood upon microorganisms such as the staphylococcus and the streptococcus which are not directly killed by the serum, is known to be almost entirely dependent on leucocytic activity *plus the opsonic* influence of the serum. As Colebrook has shown that the opsonic power of the serum is practically unaffected by the arsenical compounds in question, he holds that it is justifiable to infer that increased or diminished bactericidal effects, resulting from the addition of these compounds to the blood, are attributable to changes in the functional activity of the leucocytes. In order to detect such changes he employed the "slide cell technique" introduced by Wright, Colebrook and Storer. Defibrinated blood after mixture with progressive dilutions of the drug to be tested, was implanted with a suspension of microorganisms and incubated at 37° C. in the slide cells. In the table summarizing the results of this type of experiment it is seen that the amount of "Novarsenobillon" which destroyed the bactericidal power of the blood completely was one in 8,000 and that the smallest amount which began to destroy it was one in 64,000. The figures for "Neokharsivan" were one in 8,000 and one in 64,000, for "Salvarsan" one in 2,000 and one in 16,000, for "Sulfarsenol" one in 2,000 and one in 8,000 and for "Kharsulphan" one in 1,000 and one in 4,000. The figures for "Stabilarsan" are incomplete, only the smallest amount which began to destroy the bactericidal power, one in 16,000, being given. These results are considerably different from those obtained by the study of the phagocytic function of the leucocytes as far as the smallest amount of each drug which is capable of exerting an injurious effect upon the leucocytes, is concerned. Colebrook explains the discrepancy by pointing out that very dilute solutions of these arsenical drugs take effect on leucocytes and bacteria only after the lapse of some hours. The bactericidal action of leucocytes in blood, on the other hand, is completed quickly, within the first two or three hours of contact with the test microorganisms. In the slide experiments, therefore, it is possible for the bactericidal action of the leucocytes to be completed before they begin to be poisoned by the arsenical drugs.

Observations on Patients.

In view of the fact that a certain amount of arsenic is retained in the blood for a considerable time after the administration of the ordinary therapeutic dose of "Salvarsan" and "Novarsenobenzene," Colebrook raises the question as to whether this amount is sufficient to produce toxic effects upon the leucocytes *in vivo* like those which have been obtained *in vitro*. In order to answer this question he obtained data in regard to the concentration of the drugs in the blood of patients at varying intervals after a dose or series of doses and tested the functional activity of the leucocytes of patients at similar intervals in order to detect the onset of any toxic changes which might occur.

It was shown by Fordyce, Rosen and Myers in 1924 that within a few minutes of the intravenous injection of "Salvarsan" or "Novarsenobenzene" only about 60% of the arsenic can be found in the blood stream and that the concentration diminishes fairly rapidly during the first hour. After that time it falls away very slowly. Colebrook calculates from the work of these authors that one hour after a dose of 0·45 to 0·6 gramme of "Novarsenobenzene" the concentration of the drug in the blood is approximately one in 80,000, after twenty-four hours the concentration has fallen to approximately one in 230,000 and after forty-eight hours there is still one part in 152,000. He regards these figures as significant when they are considered in relationship to the data derived from the *in vitro* experiments. Even if allowance is made for the estimates being as much as 20% too high, they suggest that enough of the drug is retained in the blood after doses of 0·6 gramme and upwards of "Novarsenobenzene" to exert a small toxic effect on the patient's leucocytes. This drug in these doses would seem, therefore, to be contraindicated for the treatment of severe bacterial infections and the more so since, as is shown later on in the report, the leucocytes of patients suffering from such infections have proved to be more sensitive to the action of these drugs than normal cells. With arsenical drugs of the "Sulfarsenol" type the situation is somewhat different. Here, although the concentration of the drug in the blood after two or more intramuscular doses is of the same order as that found in the patients treated by "Novarsenobenzene," the probability of a toxic action upon the leucocytes *in vivo* is very much less in proportion as these compounds are less toxic than "Novarsenobenzene" *in vitro*. Particulars are given of estimations made after the administration of drugs of this type to three patients; the highest figure obtained was one in 90,000 and one in 80,000 was the amount found necessary to produce a minimal effect upon human leucocytes *in vitro*. It was concluded that the administration of the drugs to these patients had no adverse effect upon their leucocytes. This conclusion was borne out by the results of the estimation of the functional capacity of the leucocytes of two of the patients. In order to test the functional activity of the leucocytes of patients under treatment with arsenical drugs, samples of blood were taken from patients before and at intervals after an injection of one of the drugs. The corpuscles were washed in 0·85% salt solution and afterwards incorporated in phagocytic mixtures along with normal serum and an emulsion of staphylococci. Corpuscles of a normal individual of the same blood group were similarly mixed with normal serum and staphylococci for purposes of comparison. The phagocytosis occurring in the mixtures on incubation was determined by counting stained "opsonic" films in the usual manner. The records of five persons are tabulated; they are the only ones in regard to whom the efficiency of the leucocytes was tested at intervals exceeding six hours after the dose. The results are regarded as agreeing moderately well with the expectations formed from the arsenic estimations already referred to. Following a large dose of "Novarsenobenzene" there was a falling off in the activity of the leucocytes in three cases out of four and this was most pronounced in the patients suffering from the severe infections. In one of the latter the change for the worse in the clinical condition coincided with the diminished

functioning of the leucocytes. The administration of "Kharsulphan" and "Metarsenobillon" on the other hand did not lead to any appreciable reduction of leucocytic efficiency.

The Bactericidal Potency Conferred Upon the Whole Blood.

Colebrook points out that the experimental results so far described have led to two main conclusions. In the first place injection of many of these arsenical compounds in the quantities in which they are well tolerated by the human body in the treatment of syphilis, confers bactericidal potency upon the patient's serum for a number of hours or even days. In the second place when they are present in the blood *in vitro* in certain concentrations, these drugs exhibit a destructive affinity for human leucocytes. It is thus seen that these two influences have a directly opposite effect upon the bactericidal power of the blood as a whole. If the opposing influences are equally balanced, what is gained in the serum, may be lost by the poisoning of the leucocytes. The quantitative estimations which he has given, however, make it appear probable that by suitable adjustment of the dose of the arsenical drug it would be possible to give bactericidal potency to the serum without doing any appreciable harm to the leucocytes. In order to determine how far this could actually be done both *in vivo* and *in vitro* he carried out a further series of experiments.

In Vitro Experiments.

A sample of defibrinated blood from a normal man was divided into three portions and to two of these "Novarsenobenzene" was added. All were then implanted with the same quantity of a suitably diluted culture of hæmolytic streptococci and incubated in sealed tubules on a slowly revolving drum; this was done in order to secure a maximum contact between the leucocytes and cocci. At stated intervals a fifty cubic millimetre sample was taken from each tubule and explanted into melted blood agar. It was found that the reduction of the number of colonies growing from samples of the controlled blood taken during the first four hours indicated either the killing or the aggregation of the cocci by leucocytes. After that period probably multiplication of the cocci went on simultaneously, but with an increasing balance in favour of multiplication. The addition of one part in 100,000 of "Novarsenobenzene" to the blood did not affect the diminution of the number of colonies brought about by the leucocytes during the first hour hours, but after that time it checked multiplication of the cocci and sufficed to sterilize the blood in twenty-four hours. The addition of one part in 50,000 produced quite a different effect. In this strength the drug was apparently more ready to enter into destructive combination with the protoplasm of the leucocytes. This effect began to appear in the four hours' test and by this combination the drug forfeited so much of its bactericidal power that it was unable afterwards to kill or even restrain the growth of the streptococci. Similar experiments were carried out with other arsenical drugs. Details are given of one series of experiments with "Kharsulphan." In this experiment there was no instance in which the addition of the arsenical compound rendered the blood less effective than the control blood in restraining the growth of the streptococcus. On the other hand, three of the five doses employed resulted in much enhanced bactericidal effects.

In order to test the supposition that the leucocytes of patients heavily infected with streptococci would prove more sensitive to the toxic action of arsenical drugs than the normal leucocytes, blood was taken from a patient suffering from streptococcal septicæmia, divided into several portions and mixed with varying amounts of "Metarsenobillon." The blood so treated was used for two experiments, a bastericidal test similar to the one just described and a phagocytic test. The bactericidal test was made in duplicate, two different strains of hæmolytic streptococci being used. In the first test it was found that in all the samples of blood treated with the drug the streptococci were at first reduced in numbers just as in the control or untreated blood. Moreover, except in the case of the blood containing one part in 40,000 of the drug the cocci subsequently grew unchecked by the drug. It was estimated by the results obtained from the phagocytic experiments shortly to be described that the greater killing power of the drug containing one part in 40,000 of the drug was obtained at the cost of a destruction of nearly 70% of the leucocytes. Colebrook points out that a concentration as great as this could not be maintained in a patient's blood *in vivo*. In the second test there was evidence that the one in 40,000 addition of the drug had begun to take effect on the leucocytes even within the first two hours of contact. Here also with three of the four additions of the drug there was some evidence of a bactericidal and streptococcus-inhibiting effect on longer incubation, although these effects were much less than had been obtained with normal blood. The difference between the two tests in this regard was ascribed to slightly different degrees of sensitiveness of the two strains of streptococci. In the phagocytic experiment the samples of blood containing "Metarsenobillon" were incubated for twenty hours, the serum was then pipetted off, the corpuscles were washed and subsequently incubated with normal serum and staphylococci. A parallel series of tests with the blood of a normal man was put up at the same time. It was found that the leucocytes of the patient were more sensitive to the toxic action of the drug than those of the normal man. This observation was confirmed by a series of tests carried out with the blood of four other patients who were suffering from acute infections with fever which had persisted for twelve days or more. In discussing the significance of these results Colebrook suggests that injury to a patient's leucocytes may be avoided by the simple expedient of giving small doses, suitably spaced, by the intramuscular or subcutaneous route.

In Vivo Experiments.

Samples of defibrinated blood were obtained from patients before and at intervals after the injection of one of the arsenical drugs and the bactericidal and growth-inhibiting power of these specimens of blood was determined by the method used in previous experiments. Details are given of observations made with the blood of a man who received an intravenous injection of 0·9 gramme of "Novarsenobenzene." The bactericidal tests were carried out with a hæmolytic streptococcus. The results are set out in the form of a table. Colebrook points out that there is evidence of a very considerable increase of the killing and growth-inhibiting power of the patient's whole blood which persisted for twenty-four hours after a single intravenous injection of the drug. In another patient a similar increase of bactericidal power was obtained, somewhat more slowly, however, following a series of three intramuscular injections of "Metarsenobillon."

The Possible Usefulness of These Drugs in Streptococcal Infections.

Colebrook considers the possible usefulness of these arsenical drugs in the treatment of streptococcal infection and deals with two questions. The first is whether the experimental results which he has obtained, justify the view that the administration of any one of the compounds will directly bring about the destruction of streptococci in the infected patient. The second is nearly related and has to do with the system of administration which is most likely to secure that result.

It is impossible to answer the first question with either an emphatic yes or no. Several definite statements can, however, be made. In the first place infections due to the group of hæmolytic streptococci are more likely to be influenced by these drugs than are those due to streptococci of the *viridans* type, staphylococci or enterococci. In the second place there is unquestionably some hope to be derived from the fact that it is now possible to change the blood of patients in such a way as to favour the destruction of hæmolytic streptococci in the body and to maintain that changed condition for a considerable time. The blood fluids of all patients will acquire some measure of streptococcicidal power. How far this acquired power will actually serve to destroy streptococci in the tissues is at present a matter for speculation. It is not known whether the active agent will find its way out

from the blood into the lymph spaces in a concentration sufficient to kill streptococci, nor how far in the future it may be possible to assist the outward passage of the drug. In the meantime it seems justifiable to conclude that one step in the right direction has been taken when it is definitely possible to improve the bactericidal power of a patient's blood. Thus, although it is by no means certain that it would be so, the administration of these drugs might assist the recovery of a patient in an early stage of septicæmia, that is when the streptococci are likely to be relatively accessible to the bactericidal agents of the blood. Colebrook holds that the experimental findings reported by him are sufficient to warrant an extended clinical trial of these arsenical compounds in the control of infections by hæmolytic streptococci. At the same time he issues a warning that is well to remember that expectations of success may not be realized. Clinical trials should therefore be approached with an open mind. Puerperal fever is the condition most suitable for clinical trial, particularly in patients who have been ill for only a few days. It may be difficult to appraise the value of such treatment. If judgement is to depend upon the saving of patients with septicæmia whose condition is far advanced and apparently hopeless, it will be difficult, because the pathological conditions frequently oppose an insuperable obstacle to the operation of even an ideally effective chemo-therapeutic remedy. On the other hand, if judgement is to be based on the recovery of patients in the early stages when conditions are more favourable to the action of an "internal disinfectant," it will also be difficult, because so many of these patients recover spontaneously and quickly without any specific treatment.

Practical Considerations in Therapy.

Colebrook lays down two guiding principles as a result of his experimental data. In the first place, in view of its very slow action on the microorganisms it is desirable to maintain for a considerable period such a concentration of the arsenical drug in the blood as is sufficient to kill hæmolytic streptococci. In the second place, the administration should be so planned as to avoid a concentration in the blood of sufficient strength to allow of a toxic action on the patient's leucocytes with consequent weakening of his natural defensive forces. There is also the paramount necessity of avoiding a toxic action on all vital tissues such as those of the liver, central nervous system *et cetera*.

The plan recommended by Colebrook for the administration of one of these drugs, is as follows: A first dose of 0·3 gramme is given. A second dose of the same size is given six hours later. A third dose of the same size is given fifteen to eighteen hours after the second. A fourth dose, again of the same size, is given twenty-four hours after the third. If further doses should be necessary, he recommends that doses of similar size should be given, the fifth dose forty-eight hours after the fourth, the sixth dose three days after the fifth, the seventh dose four days after the sixth and the eighth dose five days after the seventh. When the streptococci are accessible to local applications, steps should be taken to promote and maintain the free flow of blood through those tissues and the passage of the bactericidal agent from the blood into the lymph spaces. Thus hot fomentations should be applied to the skin and frequent use should be made of such drawing agents as glycerine and hypertonic salt solution in the uterine cavity.

Further Work Suggested by These Results.

Colebrook refers to a number of interesting questions which arise out of his findings, and he states that he hopes to deal with some of them after further study.

The first question is whether the bactericidal power conferred upon the serum of patients under treatment by these arsenical drugs is attributable to simple solution of drug in the serum or whether it is due to some hypothetical "alteration product" formed from the drug in the patient's body or whether again it is due to the elaboration of some antibody by the patient himself under the stimulus of the chemical agent administered. With the evidence available Colebrook leans towards the first of these possibilities.

Another question is whether the streptococcicidal power, shown to be possessed by certain arsenical drugs, can be related to one specific feature of their chemical structure. If this can be established, it will give some ground for hope that it may be possible so to modify that structure as to furnish compounds having a still higher affinity for the cocci and a lower affinity for the tissues of the human body.

The lag which characterizes the bactericidal effects of these arsenical drugs, gives rise to speculation as to the nature of their bactericidal nature and wherein it differs from that of other antiseptic agents. Colebrook points out that if Ehrlich's side-chain theory is applicable to microorganisms, the lag phenomenon might perhaps be accounted for on the supposition that these arsenical drugs attack the bacterial side chain, while the more quickly lethal "antiseptics" attack the vital ring itself.

Another point which requires to be investigated is the present indication that hæmolytic streptococci do not readily become "fast" towards these arsenical compounds.

Colebrook also hopes that the experimental procedure adopted by him will raise discussion as to what tests are appropriate to the examination of any proposed chemo-therapeutic agent.

The last question, referred to by him, is the bearing which his results have upon the chemo-therapy of syphilis. He holds that there is a strong case for reopening the question whether the curative effect of these drugs in syphilis may not after all be due to a direct action on the infecting spirochæte.

Hospitals.

THE ROYAL ALEXANDRA HOSPITAL FOR CHILDREN.

THE annual report of the Royal Alexandra Hospital for Children, Sydney, was presented to the annual meeting of benefactors and subscribers on April 18, 1928. The report contains information of much importance to the medical profession and some of still greater importance to the community in general and to the Government of New South Wales in particular.

The Work of the Hospital.

During the year 1927 no less than 8,538 new patients were admitted. There were 297 patients in the hospital at the beginning of the year and 267 on the last day. The number discharged was 8,098. One hundred and eighteen patients died within twenty-four hours of admission and 350 died after having been in the hospital for more than this time. The mortality excluding the patients who died within one day of admission was 4·14% or if all deaths be included 5·46%.

In addition to these in-patients 30,572 patients were treated in the casualty and out-patients' departments, bringing the total number of patients treated at the hospital in the year to 39,549. Ten years ago the number of in-patients was only 3,785 and twenty years ago it was 1,093. It will thus be seen that the amount of work carried out at this institution has increased rapidly and that at the present time it is very considerable. It is not only very considerable, but it is also invaluable. Every facility is provided for the proper and skilful treatment of sick children of the largest city in Australia at this hospital. The members of the staff are highly competent and the gratuitous service rendered by the practitioners on the honorary medical staff is given generously and without stint.

It costs much money to keep up the full efficiency of a great institution like the Children's Hospital. The number of patients is increasing; the upkeep of the departments is becoming yearly more expensive; modern diagnostic methods and modern treatment are becoming more complicated as time advances and demand the employment of an increasingly large staff of non-medical persons. With the increase in the cost of labour, the expense attaching to each department is augmented year by year. More

salaried medical officers and a larger staff of nurses are needed today than were required twenty years ago. It is small wonder that the total ordinary and extraordinary expenditure of the hospital is now close on £100,000 in the year. Of this sum the patients or patients' parents and guardians contributed but £7,258. The charitable public subscribed no less than £36,279 and the Government provided £21,258. The contribution from the Government is £4,091 less than it was in the previous year, in spite of the urgent need for expansion and for fresh buildings. The position is becoming very difficult. The State has accepted in principle its responsibilities in regard to the essential hospitals. The charitable public may have failed to some extent in the past to provide adequately for the great institutions where the sick poor receive medical attendance. As soon as it became clear that part of the cost was being defrayed out of consolidated revenue, many persons either withdrew their contributions altogether or reduced the amount. As a result the hospitals at the present time cannot hope to meet the heavy expenses out of funds provided voluntarily and naturally turn to the governments to complete their self-imposed tasks. When governments fail, the position of the great hospitals becomes intolerable. The Government of New South Wales must realize that it is incurring a heavy responsibility in connexion with the Royal Alexandra Hospital for Children. Unless it is prepared to double or treble its subsidy to this admirable institution, it will forfeit the confidence of the public and prove to everyone that it is not competent to handle the money of the people.

The Treatment of Children with Diphtheria.

In all civilized communities the control of infectious diseases is regarded as a matter for the public health authority. The Department of Public Health of New South Wales has a large hospital at Long Bay, the Coast Hospital, where persons suffering from dangerous infectious diseases can be treated free of cost. It is quite obvious that it would be inadvisable from an epidemiological point of view if this hospital were the only institution where a disease like diphtheria is treated. The incidence of this disease has not diminished as rapidly as it should. The mortality is still much too high. Both facts are caused by the failure to isolate children at the outset of infection and to apply antitoxin without loss of time. To facilitate this, adequate and suitable accommodation for patients suffering from this disease should be provided at the hospitals reserved for children as well as at other large institutions. The demand made during the year 1927 for beds in the diphtheria ward has been much greater than in previous years. It was at the request of the Government that this ward was erected in 1917, after the hospital had been transferred from Glebe to Camperdown. A temporary structure was built and this has already been in occupation for twenty-one years. It has outlasted its purpose. The time has come when a large permanent ward should be erected. This ward should be constructed and maintained at the expense of the Government. It is little short of scandalous that the Government should evade its obligations in this respect. The sum of £30,000 is required to build a suitable ward for a public health purpose. That the Government recognizes the value of the diphtheria ward at the Royal Alexandra Hospital is demonstrated by its previous action. Accommodation has been used for as many as thirty-six little patients at one time during the past year. The Board of Management asks that the Government should meet one half of the expense and that the charitable public should find the other half. Surely this is a matter in connexion with which no appeal should be made to charity or benevolence. It is a function of the State to do as much as is possible to combat diphtheria and other notifiable infective diseases. We trust that no further time will be lost and that the Government will sanction the expenditure of the whole sum required for building the diphtheria ward at the Hospital. It is pointed out in the report that if the Board declined to treat children with diphtheria, many lives would be lost. We would add that this action would inevitably result in a wider spread of infection.

There are many other matters of interest in the report, with which we cannot deal at present.

Special Correspondence.

LONDON LETTER.

By Our Special Correspondent.

Women Students.

There are two problems which have come very much to the front lately in regard to hospitals in London. The first of these is a highly controversial one, the question of the admission or retention as the case may be of women students in the London hospitals. As the matter is still under discussion it is not possible to do more than make a general comment on the situation.

During the war, when there was a dearth of men students, some of the London hospitals which had hitherto taken only that sex, opened their doors to women; since the armistice, however, the tendency has been gradually to restrict or even to withdraw entirely this privilege. Within the last week or so three more London hospitals have decided to exclude women students in future and this action appears to have brought matters to a head. Following the publication of the decision of the hospitals a storm of approval and dissention manifested itself in the press. Mr. Walter Spencer, Vice-President of the Westminster Hospital (one of the hospitals concerned) announced his intention of proposing a motion calling for the setting up of a committee to inquire into the question of banning women students. His views which were in favour of the admission of women, were opposed in particular by Sir James Purves-Stewart, Senior Physician of the Westminster Hospital, who wrote a letter to *The Times* strongly upholding the action of his and the other hospitals in the matter. The motion put forward by Mr. Spencer was passed and a committee was appointed by the Senate of the London University; of the eleven members serving on the committee two are women. In the meantime the flow of letters and articles to the newspapers is unabated and shows that great interest is being taken in the subject, not only by the medical, but also by the lay members of the public.

Hospital Accommodation for Persons of Limited Means.

Perhaps the most serious handicap that can be imposed these days on men and women who must earn their livings is illness. Into this problem comes that of housing. Lack of houses at the end of the war was a very burning question indeed in England. Great efforts have been made to catch up with the shortage, but there are still far from sufficient to meet the needs of the population, especially in large towns. There is, therefore, a growing compulsion on people to live in flats or limited accommodation and this makes it impossible for persons with any but slight illnesses to be nursed at home. On the other hand rooms in private nursing homes are a prohibitive price, to which must be added medical fees and nursing charges. Everything is done for the sick poor, in the way of large, well-equipped hospitals and the finest medical and surgical attention in London and as far as the wealthy are concerned the price of nursing homes and treatment does not seriously affect them. But between these two extremes is an enormous middle class for whom up to the present little provision has been made. This class consists of people of moderate means, those living on a small fixed income which has in most cases not increased with the cost of living, and those whose salaries are above the amount under which national health insurance is compulsory, yet less than the incomes which are considered to belong to the wealthy class. It is not fair to say that nothing has been done to alleviate the distress of this class of patient, but the progress is slow and up to the present certainly does not cope adequately with the requirements of the situation. Certain hospitals have set aside paying wards for sick persons of moderate means, the payment required sometimes being an arbitrary rate, but more often being graded according to the financial status of the patient. The amount actually to be paid is settled usually by an almoner who is supposed to make careful inquiries into the income and liabilities of the

applicant. These arrangements are certainly a step in the right direction, but the hospital charges are still rather in excess of what the man of moderate means should really afford to pay. Various other suggestions have been made from time to time in connexion with this vexed question, such as payment on the instalment system and the utilization of the Poor Law infirmaries. There is also some talk of building special hospitals for the reception of paying patients, but the cost of construction, equipment and maintenance is so heavy that the scheme seems unlikely to materialize in the very near future.

Obituary.

DONALD AENEAS DUNLOP MacMASTER.

IT was our painful duty last week to announce the death of Donald Aeneas Dunlop MacMaster on April 18, 1928, at the age of fifty-three. His last illness began suddenly. He appeared to be in excellent health when he was taken ill. Improvement followed within a short time, but complications set in and the end came almost unexpectedly.

Donald MacMaster was born in Sydney on October 1, 1875. He was the youngest son of the late Hugh MacMaster. He had two elder brothers, both of whom entered the medical profession. One of them, Dr. John MacMaster, of North Sydney, survives him. Donald MacMaster was educated at the Sydney Grammar School. From his childhood he had a receptive mind and retentive memory. At school he quickly outstripped the majority of his schoolmates. His masters, including the headmaster, formed a high opinion of the boy's ability. He secured an excellent pass at one of the school examinations and was bracketed with G. W. Waddell for the Greek medal.

The promise of his early youth was fulfilled at the University of Sydney where he completed a brilliant and eminently successful career. He graduated in Arts in 1894, in Science in 1897 and in Medicine in 1899. In the third year of his Arts course he gained the Wentworth gold medal for an English essay on the relations of science and literature. During his medical course his contemporaries frequently turned to him for guidance and help. He secured the senior place in the final examination in medicine. This was a great achievement, for there were many men of exceptional ability in his year. He had a sociable disposition and enjoyed play as well as work. He was deservedly popular at the University. He graduated in the year 1899. His favourite sport was rowing. He stroked the winning crew in the "freshers'" race. He was one of the victorious crew in the maiden, junior and senior-junior fours. He was offered a seat in the University eight, but he was unable to accept it. He was a member of the committee of the Boat Club. He took part once only in an "inter-year" cricket match. He was a member of the committee of the Undergraduates' Association for five years and his counsel and help were frequently sought and used. For a time he acted as secretary and later he was elected vice-president. For four years he was a member of the editorial staff of *Hermes*, the University magazine. He also served on the committee of the Students' Medical Society, edited its journal for a time and acted for a term as vice-president. It appears that he was the graduate editor of the journal during the period when he was a resident medical officer at the Sydney Hospital. After a year at the Sydney Hospital he joined the resident staff of the Royal Alexandra Hospital for Children, where he subsequently became Medical Superintendent. Later he undertook private general practice in North Sydney for a few years. In 1916 he gave up general work and specialized in children's diseases. He was then appointed an honorary surgeon at the Royal Alexandra Hospital. At the time of his death he was an honorary consulting surgeon at this institution. He was a good surgeon and a dexterous operator. His judgement was rarely at fault as a diagnostician.

In 1901 Donald MacMaster visited England to continue his professional studies. He worked for and gained the diplomas of licentiate of the Royal College of Physicians of London and member of the Royal College of Surgeons of England. In 1905 he made a second journey abroad. He included America this time in his wanderings, in order to fulfil a commission from the Board of Management of the Royal Alexandra Hospital for Children to inquire into and report upon the latest advances in hospital construction and the treatment of children's diseases. His report, a valuable document, was published in pamphlet form.

Donald MacMaster was versatile and had much aptitude in invention. His contributions to medical literature were very few. This is attributable partly to lack of leisure and partly to continued ill health. For many years he was a martyr to constant pain. He read a paper before the 1908 session of the Australasian Medical Congress at Melbourne on the prevention of infectious diseases in children.

He was an Australian-Scot. Both the Highlands and the Lowlands claimed him, but in character he conformed more closely to the Highland type. He was bold, determined and forceful. There was nothing to which he could not attain, if he made up his mind to do so. Generous is a feeble term by which to express his great bounty. His generosity knew no limit. His welcome to his friends was typically Highland. Those who were fortunate enough to experience and to enjoy it, will never forget its spontaneity nor its largeness. His one regret in dying was that he would be deprived of the opportunity of showing a visiting Highland cousin some hospitality. "The vagrant train" knew him well. From them he received benedictions, while they got the best he had to give. Very often they left his rooms richer than when they entered. The world is poorer through the passing of Donald Aeneas Dunlop MacMaster. His friends will cherish his memory.

JOHN JOHNSON.

AFTER many years of medical practice the greater number of which were spent at Mount Gambier, South Australia, Dr. John Johnson, the oldest living graduate of the University of Melbourne, passed away peacefully on April 16, 1928.

John Johnson was born at Birkeken Head, England, in 1852 and was brought to Australia as an infant. His father, William Johnson, was a chemist and was the first to hold the position of Government Analyst in Victoria. John Johnson was educated at the Melbourne Grammar School and later on he graduated in medicine at the University of Melbourne. Soon after graduation he went to London where he remained for five years. He studied at the London Hospital and was the second Australian student to be admitted as a Fellow of the Royal College of Surgeons. Among his brother students were the late Benjamin Poulton, of Adelaide, and the late Frederick Treeves. The latter regarded Johnson as an able man and expressed his regret when the latter decided to return to Australia. After his return he spent a year as resident medical officer at the Kew Asylum. In 1881 he married and moved to Robe, South Australia, where he remained for a little over a year. He then moved to Mount Gambier where he purchased the practice of Dr. Jackson, famed at that time as an eye specialist. In 1888 Johnson was appointed Assistant Colonial Surgeon of South Australia and resident surgeon of the Mount Gambier Hospital. He held this position for thirty-five years and by his consistent work endeared himself to all classes of the community. In addition to being an excellent general practitioner he attained a high degree of skill as a surgeon. Had he moved to a capital city, there is no doubt that his attainments would have been more widely recognized. As it was, his fame spread through the surrounding district and patients came to him from near and far for surgical treatment. He had an exceptionally wide experience in hydatid disease. The greater part of his energies was devoted to his work, but he found time to interest himself in his garden and in his microscope. His knowledge of diatoms and other forms of microscopical life was extensive.

John Johnson had a most charming personality and his sense of humour and inexhaustible supply of anecdote made him an ideal companion and friend. He continued his practice up to the age of seventy-two and by extensive reading and post-graduate study kept himself abreast of the latest developments in medicine. Whilst performing a blood tranfusion for a patient with pernicious anæmia in June, 1924, he was seized with a cerebral hæmorrhage and was compelled to retire. He always took an active interest in the various social organizations of his district, the Bowling Club, the Mount Gambier Club, the Technical School and many other public bodies. He was an ardent churchman and, being very musical, was a member of the church choir for many years. It is understood that a meeting has been called by the Mayor of Mount Gambier to consider what form a public memorial to him will take, but his choicest memorial will ever be the loving esteem in which he is held in the hearts of all who knew him.

Books Received.

THE PRINCIPLES OF INFANT NUTRITION AND THEIR PRACTICAL APPLICATION, by K. H. Tallerman, M.C., M.D. (Cantab.), M.R.C.P. (London), and C. K. J. Hamilton, M.C., B.M. (Oxon.), M.R.C.P. (London); 1928. London: William Heinemann (Medical Books), Limited. Demy 8vo., pp. 190. Price: 10s. net.

THE PRACTICAL MEDICINE SERIES, COMPRISING EIGHT VOLUMES ON THE YEAR'S PROGRESS IN MEDICINE AND SURGERY: Under the General Editorial Charge of Charles L. Mix, A.M., M.D.; General Surgery, Edited by Evarts A. Graham, A.B., M.D.; 1927. Chicago: The Year Book Publishers. Crown 8vo., pp. 794, with illustrations. Price: $3.00 net.

Diary for the Month.

MAY 15.—Tasmanian Branch, B.M.A.: Council.
MAY 15.—New South Wales Branch, B.M.A.: Executive and Finance Committee.
MAY 16.—Central Northern Medical Association, New South Wales.
MAY 16.—Western Australian Branch, B.M.A.: Branch.
MAY 21.—New South Wales Branch, B.M.A.: Organization and Science Committee.
MAY 22.—New South Wales Branch, B.M.A.: Medical Politics Committee.
MAY 23.—Victorian Branch, B.M.A.: Council.
MAY 25.—Queensland Branch, B.M.A.: Council.
MAY 31.—New South Wales Branch, B.M.A.: Branch.
MAY 31.—South Australian Branch, B.M.A.: Branch.
MAY 31.—Northern Districts Medical Association, New South Wales.
MAY 31.—Illawarra Suburbs Medical Association, New South Wales.

Medical Appointments.

Dr. Victor Hugo Wallace (B.M.A.) has been appointed Acting Public Vaccinator at Charlton, Victoria.

* * * *

Dr. E. Mansfield (B.M.A.) has been appointed Quarantine Officer at Cairns, Queensland.

* * * *

Dr. Hugh Stewart Oag (B.M.A.) has been appointed Honorary Visiting Medical Officer, Convalescent Hospital for Men, "Denistone House," Eastwood, New South Wales.

Medical Appointments Vacant, etc.

For announcements of medical appointments vacant, assistants, *locum tenentes* sought, etc., see "Advertiser," page xviii.

AUSTIN HOSPITAL FOR CHRONIC DISEASES, HEIDELBERG, VICTORIA: Radiologist, Pathologist and Registrar.
ROYAL AUSTRALIAN AIR FORCE: Medical Officer.
ROYAL HOSPITAL FOR WOMEN, PADDINGTON, NEW SOUTH WALES: Resident Medical Officer, Junior Resident Medical Officer.

Medical Appointments: Important Notice.

MEDICAL practitioners are requested not to apply for any appointment referred to in the following table, without having first communicated with the Honorary Secretary of the Branch named in the first column, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.1.

BRANCH.	APPOINTMENTS.
NEW SOUTH WALES: Honorary Secretary, 30 - 34, Elizabeth Street, Sydney.	Australian Natives' Association. Ashfield and District Friendly Societies' Dispensary. Balmain United Friendly Societies' Dispensary. Friendly Society Lodges at Casino. Leichhardt and Petersham Dispensary. Manchester United Oddfellows' Medical Institute, Elizabeth Street, Sydney. Marrickville United Friendly Societies' Dispensary. North Sydney United Friendly Societies. People's Prudential Benefit Society. Phœnix Mutual Provident Society.
VICTORIAN: Honorary Secretary, Medical Society Hall, East Melbourne.	All Institutes or Medical Dispensaries. Australian Prudential Association Proprietary, Limited. Mutual National Provident Club. National Provident Association. Hospital or other appointments outside Victoria.
QUEENSLAND: Honorary Secretary, B.M.A. Building, Adelaide Street, Brisbane.	Members accepting appointments as medical officers of country hospitals in Queensland are advised to submit a copy of their agreement to the Council before signing. Brisbane United Friendly Society Institute. Stannary Hills Hospital.
SOUTH AUSTRALIAN: Secretary, 207, North Terrace, Adelaide.	All Contract Practice Appointments in South Australia. Booleroo Centre Medical Club.
WESTERN AUSTRALIAN: Honorary Secretary, 65, Saint George's Terrace, Perth.	All Contract Practice Appointments in Western Australia.
NEW ZEALAND (WELLINGTON DIVISION): Honorary Secretary, Wellington.	Friendly Society Lodges, Wellington, New Zealand.

Medical practitioners are requested not to apply for appointments to positions at the Hobart General Hospital, Tasmania, without first having communicated with the Editor of THE MEDICAL JOURNAL OF AUSTRALIA, The Printing House, Seamer Street, Glebe, New South Wales.

Editorial Notices.

MANUSCRIPTS forwarded to the office of this journal cannot under any circumstances be returned. Original articles forwarded for publication are understood to be offered to THE MEDICAL JOURNAL OF AUSTRALIA alone, unless the contrary be stated.

All communications should be addressed to "The Editor," THE MEDICAL JOURNAL OF AUSTRALIA, The Printing House, Seamer Street, Glebe, Sydney. (Telephones: MW 2651-2.)

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